

# Items of Interest

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## Dental Radiography.\*

By HOWARD R. RAPER, D.D.S.,

*Professor of Operative Technic and Roentgenology at Indiana Dental College,  
Indianapolis.*

### CHAPTER VII (Continued)

#### 12. To Learn if Canals Are Open and Enlarged to the Apex Before Filling, and to Observe the Canal Filling After the Operation.

Shows a lower first molar at the end of the first sitting, after the extirpation of the pulp. The wire (the dark streak) in the distal canal reaches almost to the apex of the root. The two wires in the mesial canals penetrate only about one-half the distance to the apex. These wires pass into the canals as far as they (the canals) are enlarged. Wires are placed in the canals to learn to what depth the latter are enlarged, because the wire shows so much better in the radiograph than the open canal. In fact, the wire can be seen very clearly as a dark streak when the canal itself as a light streak can not be radiographed at all.

**Fig. 171.**

Sufficient enlargement of the canals required several sittings. The technic for enlarging the canals consisted of pumping sulphuric acid into them, neutralizing it, then reaming them out with thumb, spiral broaches. Sulphuric acid was sealed in the mesial canals at the end of the first and

**Fig. 172.**

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## ITEMS OF INTEREST

second sittings. Figure 172 shows the wires well to the apex in all three canals.

**Fig. 173.**

This radiograph shows the tooth after filling. Even after the canals are enlarged we sometimes fail to reach the apex with the gutta-percha filling. For this reason it has become my custom lately to fill only a part of the canal, then make a radiograph to see that the filling reaches the apex before finishing the operation. Dr. M. L. Rhein, of New York City, was, as far



Fig. 171



Fig. 172



Fig. 173

Fig. 171. At the end of the first sitting after removal of the pulp from the lower first molar. The dark streaks are wires passing into the canals as far as they (the canals) are enlarged—almost to the apex in the distal and about one-half the distance to the apex in the two mesial. The dark shadow in the crown of the tooth is gutta-percha, used to stop up the cavity and hold the wires.

Fig. 172. The same case as Fig. 171 after several sittings. The wires now pass well to the apex in all canals.

Fig. 173. The same case as Figs. 171 and 172. This radiograph shows the tooth after filling.

as I am able to learn, the first man to make a practice of using the radiograph as a regular routine in canal work.

The advantages in using the radiograph in this connection are as follows: All guess work is eliminated—we know exactly what we are doing. If the canal is tortuous, and we start through the side of the root, the radiograph shows us the mistake, keeps us from making a perforation, and, in many cases, enables us to follow the canal to the true apex. If the root is unusually short the radiograph keeps us from going through the apex, and if it is unusually long it keeps us from making the error of not penetrating the canal far enough. The radiograph shows patients just what is being done for them.

When a canal filling fails to reach the apex of a root by about a millimeter, this does not always mean that the canal has not been properly enlarged and filled. For, remember, the pulp does not enter the root through one large foramen, but usually through several minute openings. So, often, the extreme apex of the root is almost solid dentin and cementum.

Having observed quite a large number of radiographs in the last few years, allow me to state that many, altogether too many in our profession, fail to enlarge and fill to their apices all canals which really could, and should, be so treated. There are, perhaps, some cases where the buccal canals of upper molars and the mesial canals of lower molars simply cannot be enlarged to their apices. But this fact is no excuse for enlarging



Fig. 174

Fig. 174. Wire passing to the distal through a perforation in the upper first molar. (Radiograph by Blum of New York City.)

and filling only the upper third of such canals. (Fig. 165, lower first molar.) The stock excuse for poor canal work is "our patients will not pay a fee sufficiently large to enable us to give the necessary time to the work." But do those who thus excuse themselves really give their patients any choice in the matter? If one should show a patient a radiograph demonstrating the fact that he had only penetrated the canals about one-third their length, then explain why he should go farther, and why it would take time to do so, would the patient say, "Oh! let 'er go," or would he or she say, "I want done whatever is best?"

It is extremely difficult to radiograph the buccal roots of upper molars.

### 13. To Determine Whether an Opening Leading from a Pulp Chamber Be a Canal or a Perforation.

When one opens the tooth himself, and does not use a small, round bur on the floor of the pulp chamber, he may feel certain that any opening found must be a canal. But in cases where the pulp chamber has been opened by another operator, it is often impossible to decide whether an opening leading from the pulp chamber be the mouth of a canal or a perforation through the tooth. Pass a wire through the opening and make a radiograph.

Fig. 174.

A wire passing to the distal through a perforation in the upper first molar.

## ITEMS OF INTEREST

### 14. In Cases of Pulp Stones (Nodules).

There has been a great deal of dispute as to whether or not pulp nodules can be shown radiographically. The right answer is in the affirmative.

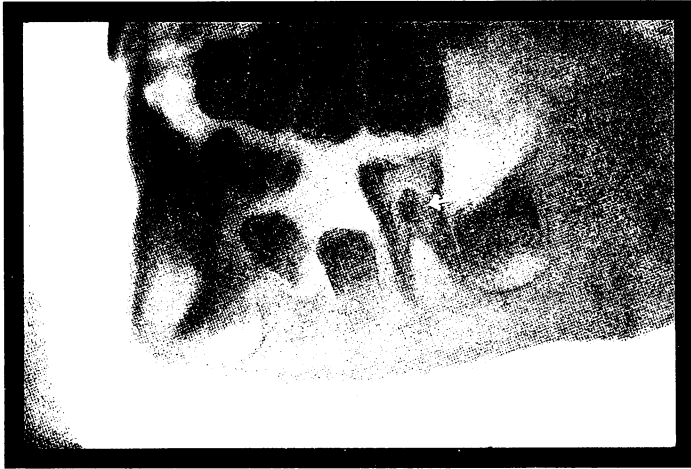


Fig. 175

Fig. 175. The upper arrow points to a pulp nodule in the lower first molar. (Radiograph by Pfahler of Philadelphia.)



Fig. 176

Fig. 176. The arrow points to a pulp nodule. (Radiograph by Cummings of Boston.)



Fig. 177

Fig. 177. Pulp nodule in the lower first molar. (Radiograph by Lewis of Chicago.)

**Fig. 175.**

The upper arrow points to a large pulp nodule in the lower first molar. Age of patient, eight.

**Fig. 176.**

A case in the practice of Dr. Chas. E. Patten. The patient, female, age forty, suffered from intermittent attacks of severe pain in the region of the

upper bicuspid and first molar. A radiograph was made (Fig. 176) and shows a shadow in the pulp chamber of the first molar. The molar was devitalized and a pulp nodule, located at the mouth of the lingual canal, removed. The canals were then enlarged and filled. Result: Complete cessation of recurrent pain.

A case in the practice of Dr. H. H. Schuhmann, of Chicago. I quote Dr. Schuhmann: "Mr. K. suffered from severe pains under left side and at angle of jaw. Pains intermittent and intense at night. No reaction to per-



Fig. 178



Fig. 179

Fig. 178. The arrow points to what might be mistaken for a pulp nodule. The shadow is, however, an amalgam filling on the buccal at the cervical.

Fig. 179. Simple occlusal filling in the molar, encroaching on the pulp.

cussion or application of heat or cold. Radiograph showed what I took to be a pulp stone, and, upon opening the tooth and applying arsenic three times the stone was removed. Patient now has no neuralgic pains whatever."

In this radiograph the arrow points to a shadow which might be mistaken for a pulp nodule. The shadow is, however, not a pulp stone, it is a small amalgam filling on the buccal surface at the cervical margin.

The radiographs which I have printed demonstrate that the pulp nodules can be radiographed. I may add that personally I have radiographed a number of cases successfully. But, let me confess, I have not as yet produced as clear a picture as the ones shown in Figs. 175, 176 and 177.

#### 15. In Cases of Secondary Dentin Being Deposited and Pinching the Pulp.

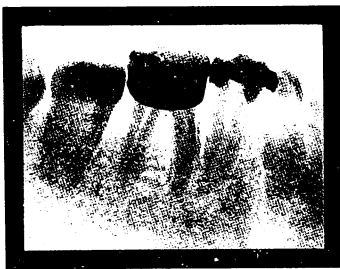
This use was recently suggested in a dental magazine by Dr. Cryer. Such a condition as the one referred to might exist and be responsible for neuralgia or other nerve disorders. Likewise it could probably be observed radiographically. At the present time, however, I am unable to show a radiograph of such a case.

## ITEMS OF INTEREST

### 16. To Learn if the Filling in the Crown of a Tooth Encroaches on the Pulp.

Case: Neuralgic pains in the lower left side of face. Thought to be due to a necrotic condition of the bone in the region of the lower first molar, which had recently been extracted. A radiograph (Fig. 179) shows the bone healthy. The simple occlusal filling in the second molar penetrates into the pulp chamber. This filling was removed, and the semi-vital pulp devitalized, removed, and the canals filled. The result was an immediate and complete recovery.

**Fig. 179.**



**Fig. 180**



**Fig. 181**

Fig. 180. The first bicuspid seems to hold a disto-occlusal filling. This appearance is due to a slight irregularity—a slight lapping of the teeth. The filling which appears to be in the distal of the first bicuspid is in the mesial of the second bicuspid. The simple occlusal filling in the first bicuspid encroaches into the pulp chamber slightly.

Fig. 181. The same as Fig. 180 with the diseased area at the apex of the first bicuspid outlined, to enable the reader to see it better in Fig. 180.

### 17. In Cases of Teeth with Large Metal Fillings or Shell Crowns Which Do Not Respond to the Cold Test, to Learn if the Canals Are Filled.

Case: Slight swelling and pain in the lower bicuspid and first molar region. The patient stated that this condition had occurred and recurred many times in the past five years. At no time had the swelling been great, and the pain was never severe. The slight swelling and an annoying pain would last for a few days, then disappear for a month or so. There was no discharging sinus. The first molar bore a gold shell crown, the second bicuspid held a large mesio-occluso-distal amalgam filling, and the first bicuspid had a small filling of amalgam in the occlusal surface. The three teeth—the first molar and the two bicusps—were isolated one at a time and tested with cold water. The patient was uncertain as to whether he received any sensation when the cold was applied to the shell-crowned molar, but thought that he did. The second bicuspid responded well, and the first bicuspid did not respond at all. This seemed to indicate a vital pulp in the molar and second bicuspid, and a devitalized one in the first



bicuspid. But, when looking for a dead pulp, one would naturally suspect either the molar with the shell crown, or the second bicuspid with the large filling instead of the first bicuspid with the small occlusal filling. The temperature test is a valuable one, but it cannot be depended upon absolutely. A radiograph (Fig. 180) was made. It shows the canals of the molar and second bicuspid unfilled. The tissues at the apices of the roots of these teeth are healthy, which, together with the positive reaction to the cold tests indicates that their pulps are vital and healthy. The



Fig. 182

Fig. 182. The roots of the shell crowned first molar are not properly filled. Only the upper third of the distal canal is filled and the mesial canals are not filled at all. The tooth was sore and caused annoying neuralgic pains.

simple occlusal filling in the first bicuspid enters the pulp chamber slightly, the canals of the tooth are unfilled, and the light area at the apex of the root indicates disease (inflammation) of the bone in that region. These things, together with the fact that the tooth did not react to the cold test, indicate a putrescent pulp in the first bicuspid. The tooth was opened, and the diagnosis confirmed.

In practice, case after case presents, the patient complaining of a slight soreness or annoying pain in the region of a shell-crowned tooth, or a tooth with a large metal filling in it. The tooth fails to respond to the cold test, and we suspect that the canals are poorly filled, or perhaps not filled at all. Are we justified in removing the crown or filling to examine the canals? Before the radiograph came into use we were, but not to-day. It is not fair to your patient nor yourself to remove a canal filling unless you can improve on the operation. Figure 181 is a radiograph of a case of the class just alluded to. After the radiograph was made I had no hesitancy in telling the patient that the crown should be removed and the canals refilled. There were only about four millimeters of canal filling near the mouth of the distal canal, and none at all in the mesial canals. Before the radiograph was made I was unable to decide whether the soreness

## ITEMS OF INTEREST

and neuralgia were caused by food packing down between the first and second molar (the contact point is bad) or improper or no canal filling.

### 18. To Learn if Apical Sensitiveness Is Due to a Large Apical Foramen or an Unremoved, Undevitalized Remnant of Pulp.

In the treatment of teeth we often pass the broach into the canal until we reach what we know must be the neighborhood of the apex, when pain is produced. It is often difficult to decide whether this pain is due to some



Fig. 183



Fig. 184

Fig. 183. Wire just penetrating the apical foramen. Showing that the apical sensitiveness is not due to an unremoved, undevitalized remnant of pulpal tissue.

Fig. 184. The wire in the canal of the lateral fails to reach the apex, proving that the apical sensitiveness is due to an unremoved, undevitalized remnant of pulpal tissue.

remaining vital pulp tissue in the canal, or the penetration of the broach through the apex. Fig. 183 is from such a case. The wire passing to the point of sensitiveness goes through the apical foramen, and so proves that the sensitiveness is not due to unremoved, undevitalized pulp tissue. In Fig. 184 the wire reaching the point of sensitiveness fails to reach the apex, proving that the sensitiveness is caused by an unremoved, undevitalized remnant of pulp.

Let us stop to consider how this question of whether or not we are penetrating the apex is decided when radiographs are not used. We pump phenol or some other obtundent into the canal, working our broach farther and farther until we strike the end of the canal ending in a blind alley, or go so far into the apical tissues we know that no tooth root could be as long as the distance we are penetrating. The use of the radiograph saves all this guesswork, obviates the necessity of causing considerable pain and is a time-saver.

**19. In Cases of Chronic Pericementitis (Lame Tooth).**

A putrescent pulp is the most common cause for pericementitis, either chronic or acute. Therefore, when the affected tooth is crowned or filled, as it almost always is in chronic pericementitis, radiographs should be made to learn whether the canals are properly filled, and treatment may be rendered accordingly. Fillings and crowns without contact points, or fillings with bad gingival margins, or crowns which do not fit well at the cervix or penetrate beneath the gum margin into the peridental membrane,



Fig. 185



Fig. 186

Fig. 185. Gutta-percha canal filling in the upper lateral passing through the side of the root to the distal. The canal filling also penetrates the apical foramen. The light area to the mesial along the apical third of the root indicates an abscess. The mesial surface of the root is roughened in the region of the abscess. (Radiograph by Lewis of Chicago.)

Fig. 186. Canal filling penetrating the tissues between the roots of the lower first molar. (Radiograph by Kells, Jr. of New Orleans.)

are sometimes the causative factors in chronic pericementitis. These things may be detected usually without the aid of the radiograph. Often, however, a radiograph will demonstrate the fault in a very convincing manner. Look at Fig. 182, for example. Observe between the first and second molar the absence of a contact point, the bulging of the crown band into the interproximal space, and the slight caries of the alveolar process.

**Figs. 185 and 186.** Figs. 185 and 186 demonstrate lesions that might be responsible for chronic pericementitis, which could not be detected by any means other than the use of the radiograph.

**20. In Cases of Alveolar Abscess to Determine Which Tooth is Responsible for the Abscess.**

**Fig. 187.** Case: A pus sinus opening on the labial between the lower central incisors near their apices. All of the lower anterior teeth sound and apparently

## ITEMS OF INTEREST

healthy. Figure 187 shows which tooth is responsible for the abscess. This tooth was treated and the abscess cured. The light area to which the arrow points, about the apex of the central, represents the abscess cavity. Acute abscesses cannot always be shown in radiographs, because there may not be sufficient destruction of bony tissue. Chronic abscesses, which have become acute, can, of course, be shown radiographically.

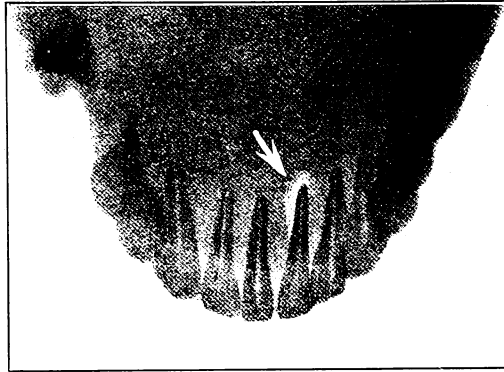


Fig. 187

Fig. 187. The arrow points to a small abscess cavity (the light area) at the apex of a lower central incisor. None of the lower anterior teeth had cavities in them. The dark spots on the distal of the crowns of the left central and lateral are caused by a slight lapping of the teeth.



Fig. 188



Fig. 189

Fig. 188. An abscess at the apex of an upper lateral incisor. This abscess pointed directly over the dummy central incisor, which is swung in on a post collar crown on the lateral and an inlay in the central incisor. Before the radiograph was made it was impossible to determine whether the lateral or central was responsible for the trouble. The central does not show clearly,—but clearly enough to show that there is no abscess cavity at its apex.

Fig. 189. The same as Fig. 188 two weeks after curettage of the pus sinus. There is some deposition of new bone.

**Figs. 188 and 189.**

Case: A bridge from an upper lateral incisor, with a post collar crown to a central with an inlay abutment, restoring a lost central incisor: a sinus

points directly above the dummy central. The lateral had been treated for an abscess two years previously. The abscess had yielded to the treatment, the canals were filled, and the bridge set. At the time when the inlay was placed in the central it was vital. A radiograph (Fig. 188) was made to determine whether the existing sinus was due to a recurrence of



Fig. 190

Fig. 190. Abscess at apex of lower second bicuspid. The tooth carries a gold shell crown. Canal is not filled. The inferior dental canal can be seen plainly in this radiograph—light streak between two dark lines along the lower border of the mandible.

the abscess of the lateral or death of the pulp and abscess of the central. The radiograph shows that the lateral is responsible. As the canal is fairly well filled (it falls short of the apex by only a fraction of a millimeter), it was deemed unnecessary to remove the crown. An incision was made on the labial and the sinus thoroughly curetted, cauterized and filled with bismuth subnitrate paste. The extreme apex of the tooth was curetted away. Fig. 189 is of the same case two weeks after the operation, at which time there were no symptoms of the disease. There is some deposit of new bone—about as much as might be expected in two weeks.

Case: The lower first and second molars absent.

**Fig. 190.** A fistula opening directly mesial to the third molar.

The third molar free of carious cavities. I suspected a piece of unremoved root of the missing second molar to be responsible for the suppuration. A radiograph (Fig. 155) was made. It demonstrates the absence of any piece of tooth root, and shows a large abscess at the apex of the shell-crowned second bicuspid. The bicuspid was opened and an antiseptic solution forced through the tooth and out through the fistulous opening in front of the third molar.

The radiograph does not show the fistulous tract leading from the bicuspid backward toward the third molar. The probable reason for this is that the tract passes along between the bone and periosteum. Therefore, there is very little destruction of bony tissue throughout its course.

Recently the following case presented: Fistulous opening on the



## ITEMS OF INTEREST

labial over the apex of a perfectly sound upper cuspid. The first bicuspid apparently healthy save for a small, faulty, amalgam filling. The proximating lateral shell crowned. I suspected the crowned lateral to be the seat of the trouble. A radiograph was made, and showed, to my surprise, that the lateral was perfectly healthy and its canal well filled. A radiograph of the first bicuspid was made and showed an abscess and unfilled canals. I do not print radiographs of this case, because one of them, the one showing the abscess, has been mislaid. I record the case because it is one the like of which a person may run across any day in practice.





## The Technique of Efficient Application of Fixed Appliances in the Correction of Malocclusion.

By DR. J. LOWE YOUNG, New York City.

*Read before the American Society of Orthodontists, at Boston, Sept., 1912.*

Fixed appliances of different varieties have been in use a great many years for the correction of malocclusion, but previous to the systematizing and standardizing of these appliances into a few simple, practical and efficient forms by Doctor Edward H. Angle, their application was very complex, impractical and inefficient.

The forms which he advocated for the correction of malocclusion comprised chiefly the expansion arch and molar clamp bands, and the leading orthodontists of to-day are using these same simple forms for treatment of the simplest, as well as the most complex, cases of malocclusion.

Certain principles of fixation of appliances are involved in their use; first, the inherent power in the appliance to hold to the teeth, so that the patient cannot remove it, such as in the clamp band, and second, the use of phosphate cements to increase this holding power, as well as to prevent deterioration of tooth surfaces under bands, which otherwise would be possible.

With these general ideas of fixed appliances in mind, a description of these simple forms of fixed appliances, previous to the description of their efficient application for tooth movement, will not be *inapropos*.

## ITEMS OF INTEREST

**Clamp Bands.** First in importance relative to the fixation principle, is the clamp band, which, by reason of the principle of the screw and nut, is mechanically most effective in being a "fixed" band, adding this power to that of the cement in holding to the tooth.

Clamp bands are furnished by the supply houses under the following designations: D, X, No. 1 and No. 2. The D band is used on the molars,

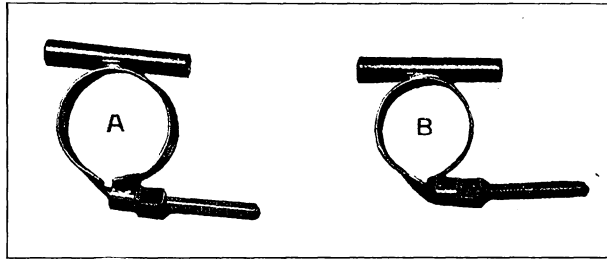


Fig. 1

and has a tube soldered to the buccal side to receive the end of the expansion arch. X bands are used on bicuspids, and also have a buccal tube. The No. 1 band is the same as the X band without the buccal tube, and the No. 2 band the same as the D band without the buccal tube. The D

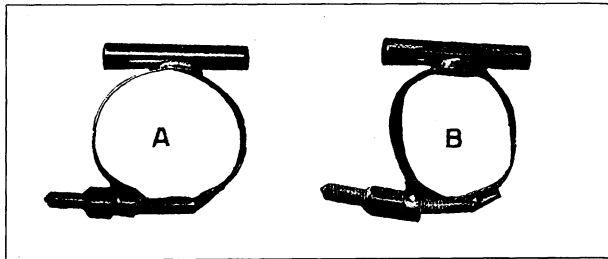


Fig. 2

bands are made in three sizes: small, medium and large. In the proper adjustment of these clamp bands, and in their correct adaptation to secure greatest efficiency, it is desirable that the following successive steps be pursued:

To facilitate the adjustment of the clamp band it is advisable to get a slight separation, both mesial and distal (if there be a tooth distal) to the tooth which the band is to encircle. This may be done by passing a heavy ligature wire through the interdental space, bringing the two ends together



# ORTHODONTIA

and twisting them tightly around the approximal contact points of the teeth to be separated. If this wire is worn for a few days there will be sufficient separation so that the band may be easily worked to place, except in some adult cases which may require some other method of tooth separation.

In these cases as well as in younger cases, ligature silk has been found very efficient for this purpose, and is used as follows: A double strand



Fig. 3

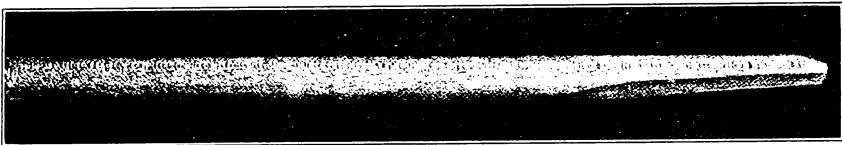


Fig. 4

of fine floss silk, engaging a loop of ligature silk, No. 3, is passed by the contact points, and the loop of the ligature silk is drawn through the interdental space to the buccal side, leaving the two free ends presenting lingually. The floss silk is then removed, leaving the ligature silk between the teeth. One end of the ligature silk is passed through the buccal loop, the other end is grasped and drawn taut, and the two securely tied together around the approximal contact points, clipping the surplus ends. Through the shrinkage of this silk ligature, sufficient space for the easy fitting of the clamp band may be obtained in any case.

## **Technique of Adjusting the Clamp Band.**

Fig. 1 represents a D band as supplied by the trade. If the nut of this band were loosened up sufficiently to allow it to be forced over the molar tooth, the edge of the band would impinge on the gum and cause unnecessary pain. To obviate this,

## ITEMS OF INTEREST

the edge of the band that presents to the gingiva should be shaped as shown in Fig. 2, with a plier designed for the purpose (Fig. 3), and the mesial portion of the band should be flattened in such a way that when forced over the tooth the lingual screw will lie very close to the lingual surface of the second bicuspid. A piece of dowel wood, shaped as in Fig. 4, is very serviceable in forcing the band to place without bending the edge of the band. As soon as the band touches the gum so as to cause

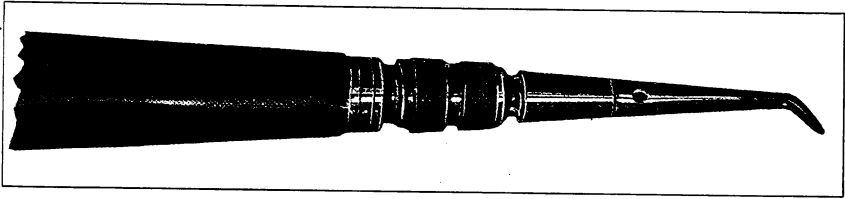


Fig. 5

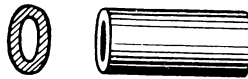


Fig. 6

any annoyance, it should be clamped on the tooth by turning up the nut with a suitable wrench, thus making the band conform somewhat to the shape of the tooth. The nut must now be loosened up sufficiently to allow the band to be carried well toward the gingiva and then reclamped by turning up the nut.

The occlusal margin of the band should also be made to conform to the tooth, and the instrument (shown in Fig. 5), devised by the writer, has been found very suitable for the purpose. It has fine serrations on each of two sides to prevent it slipping while pressing the band to place. The edges are left smooth, so that these parts of the instruments may be used as burnishers. This instrument is also very useful in removing various bands and in pressing plain bands to place when cementing them.

### **Adjustment of Buccal Tubes.**

The next step in the efficient adaptation of the clamp band is the determination of the position of the buccal tube. If this tube is not correctly placed it will be impossible to properly adjust the expansion arch. The proper location of this tube is of such great importance that it would seem advisable that it should be sold separately, so that it might be soldered on after the band is fitted; for only in a small percentage of

## ORTHODONTIA

cases in which the tube is already attached will it be found to be in the correct position when the D band is properly adjusted.

Buccal tubes of some makes can be procured separately, but the best buccal tube for general use is that devised by Dr. Angle to accommodate the friction sleeve nut.

Wherever much expansion is required in the molar region, the buccal tubes should be of such shape as to prevent the expansion arch rotating

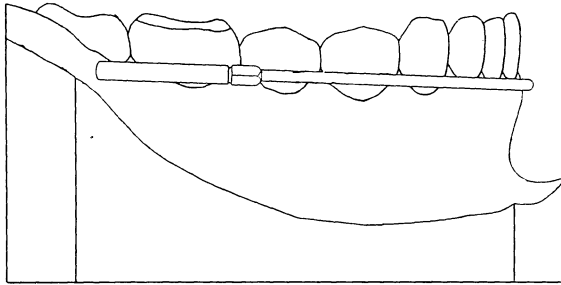


Fig. 7

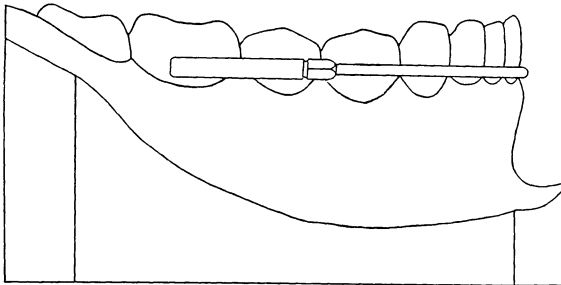


Fig. 8

in them, thus obviating tipping of the anchor teeth (Fig. 6). The mesial end of the tube should be in such a relation to the band as to allow the nut on the arch to occupy the buccal embrasure between the anchor tooth and the tooth mesial to it, as in Fig. 7. If, for any reason, this is impractical, it is then advisable to solder the distal end of the tube to the mesio-buccal corner of the molar band, and thus bring the nut in the buccal embrasure one tooth mesial to the anchor tooth, as shown in Fig. 8, necessitating also the use of a shorter expansion arch.

The direction of the tube, with very few exceptions, should be such as to cause the arch when placed in the tubes to lie very close to, if not in contact with, the buccal surfaces of the teeth mesial to the anchor tooth. The directions of the tube on each band should so harmonize that when

## ITEMS OF INTEREST

one end of the arch is inserted into the tube that is to receive it, the other end of the arch will lie on the same plane from both a vertical and horizontal view, with the tube of the opposite side, unless for some good reason, subsequently to be stated, a different position is advantageous. The tubes should be so placed that, with few exceptions, no bending of the expansion arch is required in order to have it assume its proper position in the anterior region, *i.e.*, at the gingival border (Fig. 9).

Where the anchor bands are fastened to the first permanent molars and the deciduous cuspids and molars are in place, it frequently happens that in order to prevent the expansion arch from impinging on the gum tissue the direction of the buccal tubes must be such that it will be found

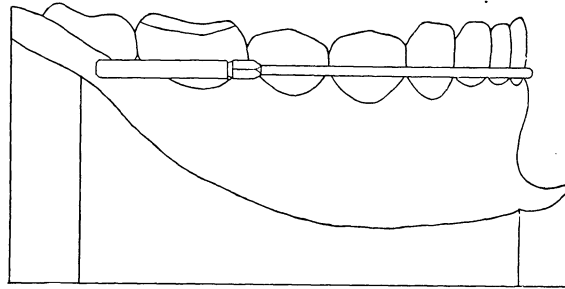


Fig. 9

necessary to bend each lateral half of the expansion arch just distal of the cuspids, in order that the front portion of the arch may assume its proper position in the incisor region.

In order to place the buccal tubes as stated above, the band must be unclamped, the tube unsoldered, and resoldered in the desired position. The band must then be reapplied and reclamped to be certain that the position of the buccal tube is correct. If found so, the band must now be removed and the tooth thoroughly polished, so as to free it from all deposits and secretions.

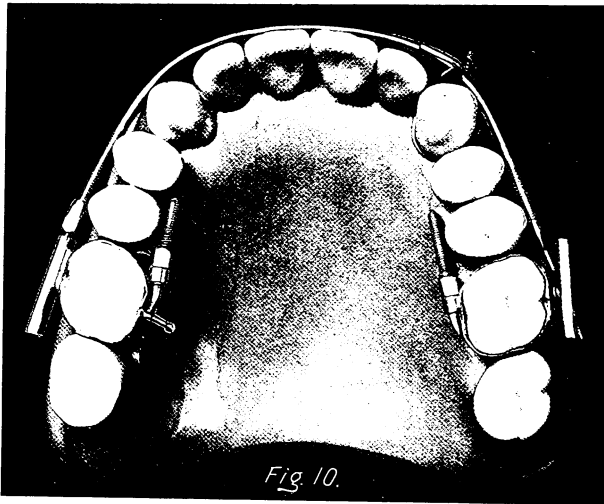
The band may then be cemented on the tooth and securely clamped. As a cementing medium, Evans's Orthodontia Gutta Percha has been found very advantageous, as it is not necessary to have the tooth dry, and there is absolutely no danger of the gutta percha dissolving out.

If a zinc phosphate is to be used for cementing these bands in place, a semi-hydraulic cement should be selected. In using such a cement it is

## ORTHODONTIA

not necessary to have the tooth perfectly dry; in fact, the cement will be stronger and better if there is a slight moisture on the tooth. However, cement cannot be depended on to adhere to a tooth from which all mucus has not been removed.

The cement is mixed by first pouring out the required quantity of liquid on the glass slab; a small portion of powder is added to this liquid from the bottle, by rolling it between the thumb and finger. This powder should be thoroughly mixed with a suitable spatula before any more powder is added. The longer this mixing process is continued up to one



minute, the slower the cement will set. Then little by little more powder is dusted out of the bottle and thoroughly spatulated until the proper consistency is attained. At this point of the procedure the tooth should be sprayed with some alkaline solution and the patient instructed to rinse the mouth with an alkaline solution. This part of the work should be attended to by the assistant. The band is now filled with this cement, and the occlusal orifice of the band closed either with the finger, or better, a piece of No. 60 tinfoil. This causes the surplus cement to escape from the gingival orifice of the band, and removes considerable of the moisture, leaving just the amount required by such a semi-hydraulic cement.

The band on the opposite side is now adjusted in like manner. By means of the expansion arch the direction of the buccal tube is now determined. This is done by inserting one end of the expansion arch into

## ITEMS OF INTEREST

the buccal tube of the cemented band, and holding the other end of it in its proper relation to the teeth on the opposite side, and noting the relation this end of the expansion arch bears to the buccal tube that is to receive it. If found, as in Fig. 10, and resoldering of the buccal tube is neglected, when the arch is sprung into position, it is inevitable that the molar on this side will be rotated. In some cases the buccal tubes can be readjusted without soldering, by using an instrument devised by Doctor Josep Grunberg, and shown in Fig. 11. When this tube is so adjusted that the arch will lie on the same plane with it from both a vertical and horizontal view, the band is ready to be cemented in place. It is always well to mark one end of the expansion arch in some way, so that it can be placed in the same tube each time.

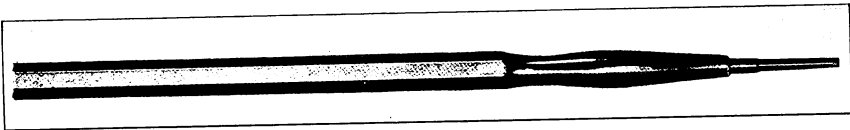


Fig. 11

### **Technique of Adjusting Plain Bands.**

As it is found necessary to fit a number of plain bands, it is desirable that the material for these bands should be as thin as possible, and yet be staple. Platinum and iridium, ten per cent. of the latter, has been found by a great many to be the most desirable metal for this purpose. It may be used as thin as .002 of an inch. Some operators have condemned this material on account of being too stiff. This stiffness can be overcome by annealing the roll of band material in an electric furnace. Fifteen-hundredths of an inch in width is a very serviceable size. Before shaping the band, one side of the strip of metal should be roughened by drawing it over a round file. The strip with the roughened side presenting inward should next be worked carefully around the tooth and well burnished to the lingual surface. It is then held with the thumb and finger and pinched with a suitable plier, so as to make it conform accurately to the shape of the tooth. After it is soldered in the usual way, a spur should be attached, as desired, for the case in hand.

The wire to be used for making such a spur should be as light as possible, and never should be heavier than the heaviest ligature wire. And if made from fifteen per cent. platinum and iridium, it can be lighter than this heavy ligature wire. Care should be exerted in placing the spur, so that when the ligature passes from the spur to the expansion arch, the tendency will be to withdraw the tooth from the socket rather than to depress it therein. Bands of such thickness are so flexible, that when sol-

## ORTHODONTIA

dered with pure gold they can be made to fit very closely, nearly all of the ten anterior teeth in each arch. On fitting bands to partially erupted cuspids, it often becomes necessary to crimp the band by pinching on both the mesial and distal portions, in addition to the regular lingual pinch usually required on a cuspid band. Bands for the upper laterals usually require a small pinch at the disto-incisal angle. Where such extra crimps are necessary, solder should be used to unite the pinched surfaces, and the surplus material trimmed away, and the ragged edge filed and polished. After the tooth to be banded is cleaned and polished, and the cement is prepared as described above, the band is filled with the cement and forced over the tooth. The lingual surfaces of the bands on each anterior tooth should be accurately burnished, so as to leave as thin a layer of cement between the bands and the tooth as possible. This is for a double purpose, first, so as to lessen the probability of the lower teeth wearing through the bands on the upper anterior teeth; second, so as to force the cement around the approximal portions of the tooth, where it may have been forced out by the band passing over the contact points. After this burnishing, the band should be forced to its final position, with a suitable driver by first pressing it on the lingual side of the band and then on the labial, using also light taps of the mallet to secure perfect adaptation.

For some years I have been rotating bicuspids just as soon as the two cusps are through the gum.

**Banding Bicuspids.** It is not an easy matter to pinch a band on a bicuspid in such a condition, but I have obviated the necessity of pinching the band in such cases by having previously made up a number of plain bands, varying in size two-hundredths of an inch in circumference. These bands I have in stock and properly labeled, ranging from eighty-hundredths of an inch to one hundred and ten hundredths of an inch in circumference. When a case presents with a bicuspid, as described above, I select the size band I think will encircle the tooth. If, upon trial, it is found too small, a larger one is selected, and so on, until the correct size is obtained. In this way I find I can band such teeth without causing any pain, and it has also been found that a very few weeks of gentle force causes these teeth to rotate without any trouble at all, and also that two or three months' retention of teeth so rotated is sufficient. Two or three years of retention is not always sufficient when rotation is begun after root and bone are fully developed.

**Degrees of  
Force in the  
Expansion Arch.**

Before considering in detail the application of the expansion arch, it becomes necessary first to designate the degrees of lateral spring force applied to the anchor teeth through the expansion arch, so

## ITEMS OF INTEREST

that an intelligent use of this force may be comprehended. This lateral spring pressure on the anchor teeth may be denoted as follows:

A—Denoting passive condition; *i.e.*, when in position the expansion arch exerts no lateral force.

AL—Denoting lingual force; *i.e.*, when in position, force is exerted lingually.

AB—Denoting buccal force; *i.e.*, when in position, slight force is exerted buccally.

AB<sub>2</sub>—Denoting greater buccal force than indicated by AB.

AB<sub>3</sub>—Denoting greatest buccal force.

Comparing the relative spring pressure of spring gold and German silver, the following caution should be observed:

Where spring gold is used for the construction of the expansion arches, and great haste is not desired, it is never necessary to put more expansion in an arch than is necessary to move the teeth the required distance. Where base metals are used in the construction of the arch, it often becomes necessary, at the beginning, to put more expansion in the arch than the distance it is expected to move the teeth.

Now, for the sake of simplicity and clearness of description, the application of the expansion arch will be considered under several headings corresponding to the various tooth movements necessary to accomplish, taking up first the simple labial movement of the incisors, and then various combinations of tooth movements found necessary in everyday practice.

### 1. To Move the Incisors Labially.

This can only be accomplished without carrying the anchor teeth buccally or lingually, by so placing the tubes on the anchor bands that they are parallel with each other. This necessitates a sharp bend (Fig. 12) in the expansion arch just in front of the nuts, in order that the arch may lie close to the cuspids and bicuspid, and not interfere with the soft tissues. The arch must be bent, so as to pass into the tubes without exerting any lateral spring, denoted Exp. A. When one end of such an arch is inserted into the tube on the anchor band, the other end should lie parallel, when passive, with the tube that is to receive it. The incisors to be carried forward are ligated to the arch, and as the nuts are turned up, this movement is accomplished.

If the incisors are inlocked, or the molars are not sufficiently fixed to resist such pressure without tipping distally, as sometimes happens in Class II, Division 2, it is advisable to solder hooks on the arch in front of the nuts, and from these use intermaxillary rubbers on each side to



# ORTHODONTIA

hook well forward on the lower expansion arch. In this way the molars can be left undisturbed, and they will be more useful as anchorage when shifting the lower teeth forward.

## 2. To Move the Incisors Labially, and the Cuspids, Bicuspsids and Molars, Buccally

In order to accomplish this, it is only necessary to so shape the expansion arch that when the labial and buccal surfaces of the teeth are brought in contact with it, they will have assumed the desired position, or the shape of the ideal dental arch.

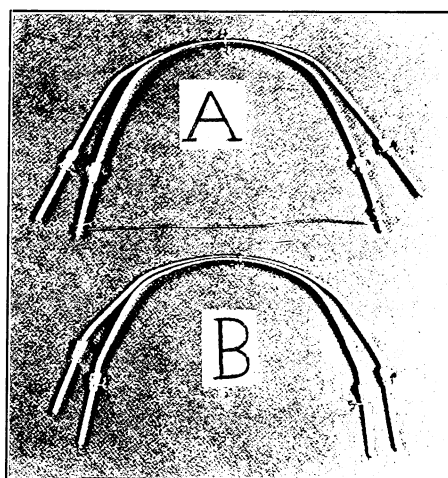


Fig. 12

This is so simple that it would seem impossible for anyone to meet with any difficulty, *but it is rare, indeed, for a beginner to properly adjust an arch for such a purpose.* The tubes on the anchor bands must be so placed that when one end of the expansion arch is inserted in the tube, the other end would, when passive, lie on the same plane, from both a vertical and horizontal view, with the tube which is to receive it. If the dental arch is to be lengthened to any extent, which is done as in No. 1, it will also cause expansion in the region of the anchor teeth. Failure to realize this fact is responsible for over-expansion in the molar region.

## 3. To Move the Incisors Lingually, and the Cuspids, Bicuspsids and Molars, Buccally.

This movement is often required on the upper arch in the treatment of Class II, Division 1. The adjustment of the tubes on the anchor bands, and the shaping of the expansion arch, should be the same as in No. 2,



## ITEMS OF INTEREST

having Exp. AB2. On trial, on the model, it will be found, when passive, to stand some distance from the cuspids, bicuspid and molars. When this expansion arch is inserted, it should stand away from the cuspids and bicuspid, and should be ligated to these teeth first. If the arch is not too heavy (.038 inch is sufficient), it can be brought in contact with these teeth, and will be carried away from the incisors. The nuts should now be loosened, so that the arch may be forced back until in contact with the incisors. If any of these are to be rotated they should be properly ligated to the arch, otherwise no ligating of the incisors is necessary. As the cuspids, bicuspid and molars on each side are carried buccally by the spring of the arch, the incisors will be carried lingually. An expansion arch so applied is practically automatic, and may be allowed to go a month without attention. If nothing breaks, the worst that can happen is to carry the incisors too far lingually, and this can be readily counteracted by turning up the nuts on the arch. Note how the force is reciprocated from one side to the other, and also to the anterior teeth.

#### **4. To Move the Cuspids, Bicuspid and Molars on One Side, Buccally.**

Usually when such a movement is necessary in either dental arch the malposed teeth are inlocked by those of the opposing jaw. In order to overcome this inlocking without displacing the teeth on the opposite side, some precaution is necessary. It is obvious that it will not do to depend on the reciprocal force of the expansion arch, as in No. 3. The attachment to the teeth on the normal side should be as nearly stationary anchorage as possible.

This may be accomplished in various ways, but the one here described seems the most applicable. The cuspid on the normal side is fitted with a plain band, and a rigid wire is soldered from the end of the screw of the clamp band to the cuspid band. This necessitates care being used while cementing these bands in place, but the cuspid tooth being easy to fit, there will be little danger of the band coming loose. The buccal tube is so shaped that the expansion arch cannot rotate in it, and should be so placed on the band that the expansion arch will lie close to the bicuspid and cuspid on the normal side. The other end of the expansion arch should lie on the same plane, from both a vertical and horizontal view, when passive, with the buccal tube, which is to receive it, and should stand away the distance it is necessary to move the malposed molar buccally.

The arch is then inserted into the tube, with the nut so placed that the arch lies very close to the incisors. As the inlocked molar moves buccally, the nut on the arch on this side should be turned up from time to time, so that the arch does not press on the incisors. If this end of the arch should tend to slip forward out of the buccal tube, it can be pre-

# ORTHODONTIA

vented by the adjustment of a rubber ligature over the back end of the tube and over a small hook soldered on the arch in front of the nut. When the molar reaches its proper position the second bicuspid may be ligated to the arch, and so on, one at a time, until all the malposed teeth are brought into proper position. In this way, it will be seen that four teeth on the normal side, two of which must move bodily if they move at all, are pitted against the inlocked molar. Subsequently, this molar can be straightened up by the proper application of retaining appliances.

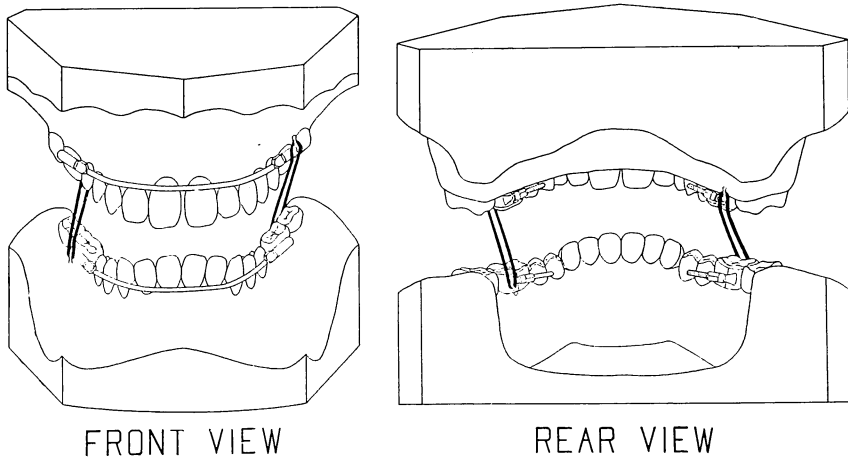


Fig. 13

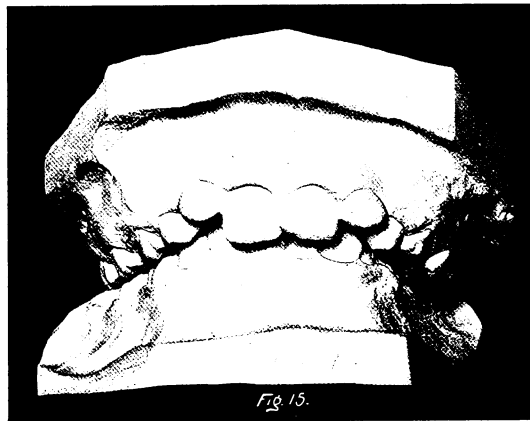
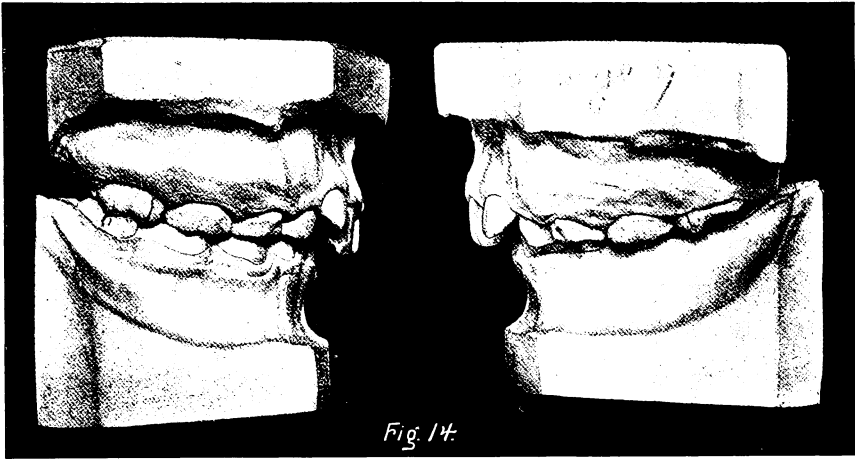
Further reinforcement of this anchorage can be obtained by the use of intermaxillary rubbers on each side (Fig. 13).

Fig. 14 shows profile views of a case requiring such application of appliances. Fig. 15 is a front view of the same.

## 5. To Move the Cuspids and Bicuspids Buccally on Each Side.

This can be accomplished without disturbing the other teeth, by so placing the buccal tubes, that when the expansion arch is inserted it will rest passively in them. The expansion arch should be of the shape and dimension that the dental arch is to assume. It will thus be found to be some distance from the malposed teeth. By use of silk ligatures these teeth can be caused to move buccally until they come in contact with the expansion arch. Or, if a light expansion arch is used, it may be ligated with wire, so as to rest in contact with the cuspids and bicuspids, and thus obviate interference with the soft tissues.

# ITEMS OF INTEREST



This necessitates the turning back of the nuts on the expansion arch, the front portion of which should be allowed to approximate the incisors. As the malposed teeth move buccally, these nuts should be gradually turned up to prevent carrying the incisors lingually.

Obviously this would cause some temporary displacement of the anchor teeth. To prevent this, the expansion arch should have Exp. AB at the beginning, and when the cuspids and bicuspid begin to move, it should be reduced to Exp. A..

## 6. To Move the Incisors Lingually and the Cuspids and Bicuspid's Buccally.

In order to do this without disturbing the anchor teeth, if for any good reason the first molars are to be used as anchorage, it is advisable to have a swivel attachment of the buccal tubes to the anchor bands, which will be described under the heading, "Rotating of Molars." The simple way to bring about such a movement is to use X bands on second bicuspid's and treat as in No. 3.

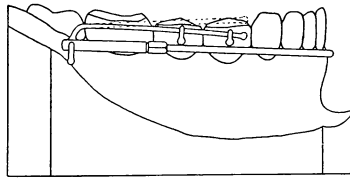


Fig. 16

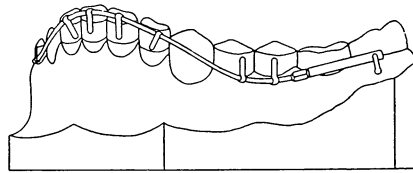


Fig. 17

## 7. To Elongate Bicuspid's.

This can be accomplished by use of an auxiliary spring soldered well to the distal end of the buccal tube, allowing it to pass forward occlusally of the expansion arch. With the expansion arch in place, and properly ligated to the cuspids and incisors, this spring is ligated to the bicuspid's in infra-occlusion. It is usually well to band these teeth so that the ligatures may be attached to proper hooks (Fig. 16). Fig. 17 shows application of a light arch, as described by Dr. Case, to accomplish these same tooth movements.

Fig. 18 shows profile and front view of a case requiring such treatment. Fig. 19 the same after treatment. Fig. 20 is the profile and front view of the face before treatment, and Fig. 21 the same views after treatment.

# ITEMS OF INTEREST

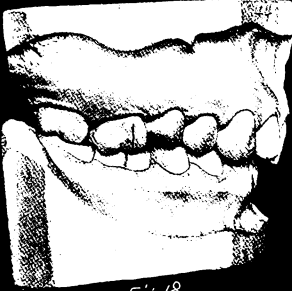


Fig. 18.

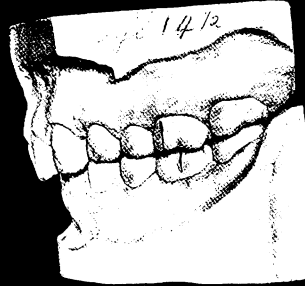


Fig. 18.

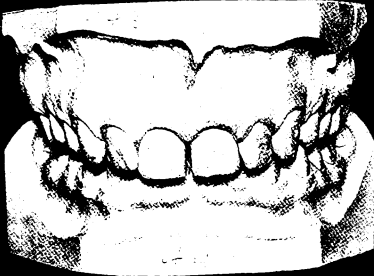


Fig. 18.

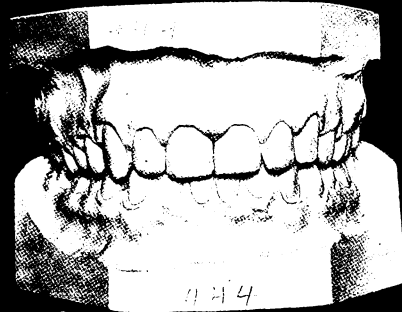


Fig. 18.



Fig. 19.

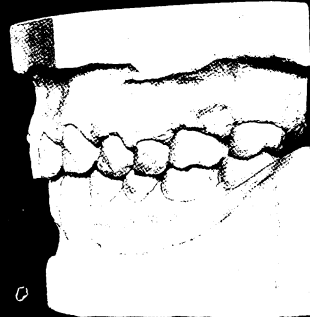


Fig. 19.



Figs. 20 and 21



#### **8. To Elongate Anterior Teeth.**

Infra-occlusion is found in various sections of the dental arch. In this connection infra-occlusion refers to teeth that are so placed that it is impossible for them to be brought in contact with the teeth of the opposing dental arch. The incisors are more often in infra-occlusion than the other teeth, and the upper incisors more often than the lower ones. Where both upper and lower anterior teeth require elongating, the application of intermaxillary rubbers is of great assistance.

The teeth to be acted on should be fitted with bands which have on their labial surfaces suitable spurs to engage the arch, so that it cannot be moved toward the incisal edges of the teeth when the mouth is open and the rubbers put on stretch. These rubbers should be applied in a triangular way. To accomplish this, spurs are soldered to the upper expansion arch in the region of the distal surface of the upper lateral incisors. These spurs point towards the gingiva. On the lower expansion arch spurs are also soldered pointing towards the gingiva, and may be placed directly under the upper spurs, or either mesial or distal to this point, as desired.

The arches are adjusted so that when passive they will rest just above the spurs on the anterior bands. If such an arch is sprung so as to rest below these spurs (*i.e.*, gingivally), the tendency will be to tip the molars mesially and elongate the anterior teeth. Sometimes it is advisable to have swivel attachments of the buccal tubes to the clamp bands and then, by use of intermaxillary rubbers, the molar tipping can be obviated.

Where the lack of vertical development is confined to the anterior teeth in one dental arch, the rubbers should not be worn. The tooth on each side most mesial, and not in infra-occlusion, should be banded and a wire soldered from it to the screw of the clamp band, as described in No. 4. This prevents forward tipping of the anchor teeth, and permits the expansion arch, which should be as light and elastic as possible, to spring from the front end of the buccal tube on each lateral half to the point where it engages the spur most distal. Owing to the length of spring thus obtained, the delicacy of adjustment is much greater and the efficiency increased.

#### **9. To Rotate the Anchor Teeth Causing the Disto-buccal Corners to Move Buccally.**

It is rare indeed to find the first molars, either upper or lower, requiring such a movement. When desired, it can easily be accomplished by so placing the buccal tubes on the anchor bands, that when one end of the expansion arch is inserted in the tube, the other end of the arch, instead of being on the same plane with the tube, from a vertical view,



# ORTHODONTIA

presents buccally towards its distal end. If both molars are to be equally rotated, the arch should be removed, and the end that was free in the first trial inserted in the tube on the opposite side.

The end that is now free should bear the same relation to the tube that is to receive it as the first one did. When the arch is inserted, it should stand away from the bicuspid on each side, and as the distal ends of the arch are caused to spring linguallly they exert a constant outward pressure, and thus rotate the molars. If necessary, by ligating the arch to the bicuspid on each side, the pressure on the molars can be increased and the rotation hastened.

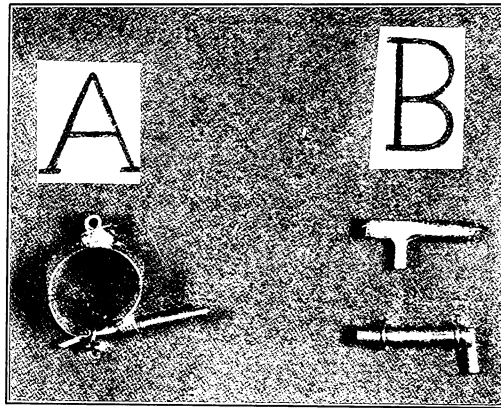


Fig. 22

## 10. To Rotate the Anchor Teeth Causing the Disto-buccal Corners to Move Lingually.

This movement is very often required in order to establish occlusion, and unlike No. 9, is often very difficult to accomplish. In young patients it can usually be done by putting a sharp bend in the expansion arch just in front of the nuts, causing the distal end of the arch to present linguallly. (B Fig. 12.) An arch so shaped tends to work out of the tubes, and, if not ligated to the anterior teeth, it should be held in place by means of a rubber ligature on each side, as described in No. 4.

In older patients, and especially where the tooth mesial to the molar to be rotated has been lost, other means must be resorted to. The D band, with the screw directed distally, is fitted to the molar to be rotated. It is then removed, the buccal tube unsoldered, and to this band is soldered a suitable round tube in such position as to lie over the mesio-buccal corner of the tooth, and be parallel with its long axis when the band is cemented and clamped in place (Fig. 22a). To the buccal tube is soldered

## ITEMS OF INTEREST

a suitable wire in the desired position (Fig. 22b), in such relation that when it is passed into the tube on the band the buccal tube will assume the proper position to receive the expansion arch, giving a hinge attachment between the arch and the band.

Where the tooth mesial to the molar to be rotated is missing, as in Fig. 23, a suitable hook can be soldered to the expansion arch in such a position that a rubber ligature can pass from the screw on the molar band to this hook without exerting pressure on the tooth in front of the space. If this arrangement is used on each side it will be observed that

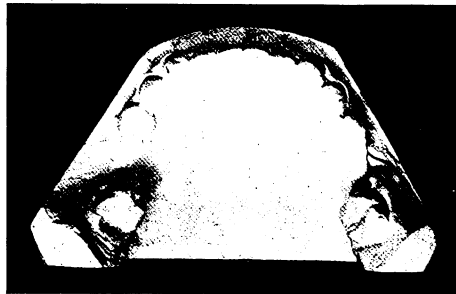


Fig. 23

we have established reciprocal force to rotate these teeth, and it is doubtful if any tooth can resist this constant pull of rubber.

Where no tooth is missing, a suitable wire of spring gold can be soldered to the molar band in such a position as to present lingually as it passes forward in the bicuspid region. This may now be ligated to the expansion arch, and caused to lie in contact with the bicuspids. From time to time, as the ligature is renewed, this lever may be bent lingually before the new ligature is applied.

### **11. To Move the Upper Incisors Lingually.**

The adjustment of the buccal tubes and the expansion arch should be the same as in No. 1, except that the sharp bends in the arch should be some distance forward of the nuts. Owing to the fact that teeth move forward so much more easily than they move backward, it becomes necessary to resort either to occipital or intermaxillary anchorage. If the latter is employed, the lower expansion arch should be adjusted in such a manner as to establish, as nearly as possible, stationary anchorage. This will be described later.

### **12. To Move Molars and Bicuspids Lingually.**

While this movement is not often required, it has been considered difficult to accomplish, but this is not so, if the spring of the expansion

arch is combined with the constant pull of rubber. A stiff arch should be employed, and should be so shaped that in order for it to be inserted into the buccal tubes it must be sprung buccally. Such an arch will always tend to move forward, unless ligated to the anterior teeth. To do this is a mistake, unless the incisors are to be moved labially or rotated. The expansion arch should be held in place, *i.e.*, so as to press against the buccal surfaces of bicuspid, by rubber ligatures, one on either side, passing from suitable hooks attached to the expansion arch over the distal ends of the buccal tubes.

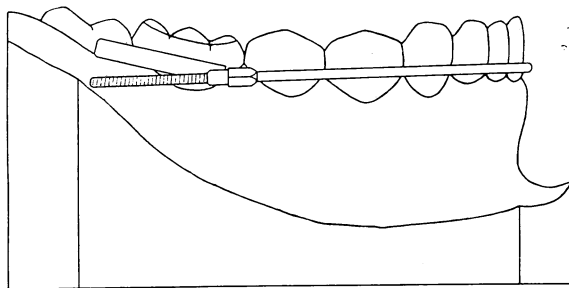


Fig. 24

If it is desirable to move these teeth bodily, it can be done by using the elliptical tube on the anchor band, and a plain band on the first bicuspid, uniting the two by soldering a piece of stiff wire from one to the other on the lingual side, as described in No. 4. If this is done on either side, and the arch inserted and worn long enough, the teeth will be carried bodily lingually.

### 13. To Straighten up Molars Tipped Mesially.

If but one molar is tipped, the tube on the anchor band for the normal side should be placed in the usual way. The other should be so attached to the anchor band that when the expansion arch is inserted in the tube on the normal side, the other end of the expansion arch should be on the same plane with the tube that is to receive it, *from a vertical view*, but from a horizontal view the mesial end of this tube should present toward the gingiva (Fig. 24). If this arch is now sprung in place the tendency will be to tip mesially the normal molar, and at the same time straighten up the tipped molar. Owing to the difficulty of depressing teeth in their sockets, the normal molar scarcely moves at all, and the tipped one is made to assume its normal position. Fig. 25 shows a case requiring such treatment.

## ITEMS OF INTEREST

When a molar on each side of the same dental arch is tipped the tubes should be placed so that when the arch is inserted the front portion will lie, when passive, at least one-eighth of an inch below the gingival border (Fig. 26). This arch should then be sprung to the proper position and firmly ligated to the cuspids and incisors. This will tend to tip

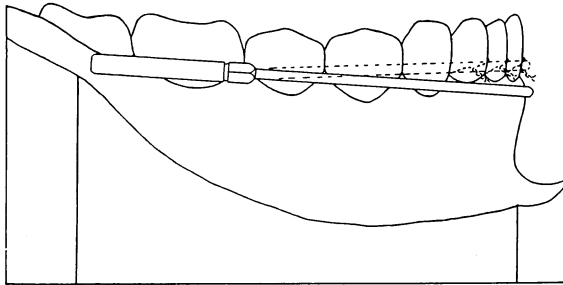
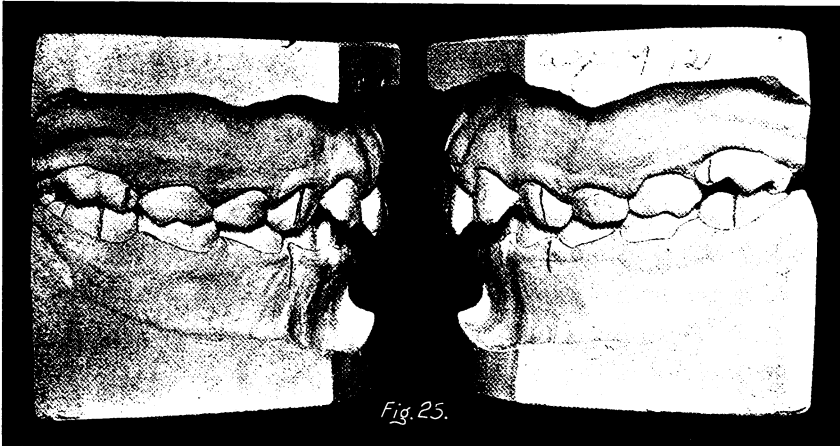


Fig. 26

the molars back, and at the same time depress the anterior teeth. The latter movement will be so slight, however, that it will not be noticeable, and as soon as the pressure is removed they will readily return to their former positions.

This manner of adjustment is also used to create stationary anchorage on the lower dental arch where desired, but in such cases the expansion arch, when inserted into the tubes, should lie, when passive, closer to the gingival border of the anterior teeth than where it is desired to tip the lower molars distally.

## 14. The Adjustment of the Arches and the Application of Intermaxillary Rubbers in the Treatment of Class II, Division 1.

It is always advisable to have both expansion arches in place when intermaxillary force is to be applied. Two methods may be employed, according to the movement required.

Where it is thought advisable to tip the molars distally, so as to place the inclined planes of these teeth in harmony with the molars on the opposing jaw, the expansion arch is adjusted in such a manner that as these teeth are tipped distally they will be in proper relation mesio-distally with the lowers.

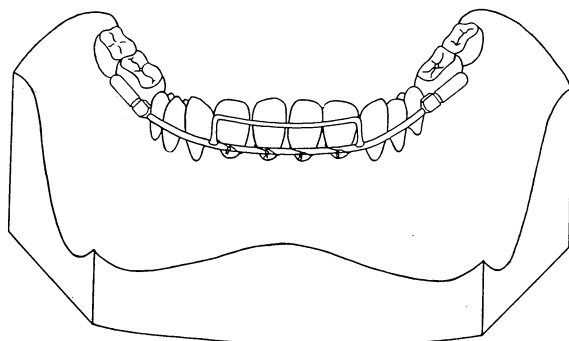


Fig. 27

The upper arch should have suitable hooks, so placed that when the arch is inserted they will be on a line with the distal surface of the upper laterals. Over these, rubber ligatures are passed to the distal end of the buccal tubes on the lower D bands. One rubber on each side is sufficient at the beginning, and if more force is required later the number of rubbers may be increased.

As the molars tip distally, the arch will require lengthening by turning up the nuts, so as to keep the front portion of the arch free from the incisor teeth. It will also be found necessary either to readjust the tubes on the anchor bands, or to put a bend in the arch on either side, so that the front section will be in proper position on the anterior teeth, which is at the gingival border. The lower arch is adjusted, as previously described, to create stationary anchorage.

This method of treatment depends very largely on efficient retention of the molars to carry the lower teeth forward as they gradually assume their upright positions.

The other method is to bring about a mesial movement of the lower teeth, without tipping the upper molars distally. To do this the upper

## ITEMS OF INTEREST

expansion arch should be adjusted as in No. 3. The lower expansion arch may be used as has been described, or one or more of the front teeth may be ligated to the arch and moved forward, by turning up the nuts on the arch, then, according to the case, two or more teeth may be ligated, and so on, until all the lower teeth are carried forward to their normal positions.

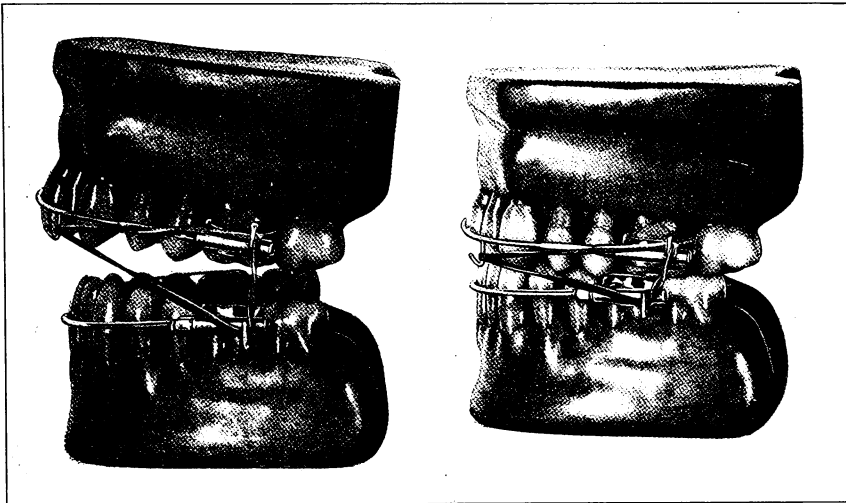


Fig. 28

An auxiliary wire soldered to the front portion of the lower expansion arch, so as to engage the labial surface of the incisors and cuspids, close to the incisal edge, has been found of value to prevent tipping of these teeth in their forward movement (Fig. 27). This wire should be of spring metal, and not over .030 of an inch in diameter, so that it may be occasionally bent in such a manner that the arch will stand away from the labial surface on the incisors and cuspids, when the auxiliary wire is in contact with the teeth.

In the treatment of a sub-division of the First Division of Class II, the intermaxillary rubber should be worn on but one side, and may be adjusted according to either method just given for the treatment of the full division.

### **15. The Adjustment of the Arches and the Application of Intermaxillary Rubbers in the Treatment of Class II, Division 2.**

As these cases usually require that the lower bicuspid and molars be elevated, it becomes necessary to use a bite plane of some description, so

as to prevent the back teeth from meeting when the jaws are closed.

As in No. 14, two methods may be employed, but the distal tipping of the upper molars in this case is far less indicated than in the treatment of the Division 1. It is preferable to use intermaxillary force, as stated in No. 1, to move the upper incisors forward, and later reverse the application of the intermaxillary elastic so as to carry the lower teeth forward, and at the same time elevate the bicuspid and molars.

This can be done by soldering suitable hooks on the upper buccal tubes, so that the intermaxillary rubbers can be applied in a triangular shape; *i.e.*, to pass from the hook on the arch in the lateral region to the hook on the buccal tube on the upper, and then over the distal end of the buccal tube on the lower on each side (Fig. 28). If necessary to increase the intermaxillary force, a second rubber may be employed on each side, but in the usual way; *i.e.*, from the hook on the upper arch over the distal end of the buccal tube on the lower. When two rubber ligatures are worn in this way, the one from the lower to the upper should be put on first. If this is not done the rubber ligature, worn in the triangular shape, is very liable to break.

The next six figures show a case of this kind treated as described above. Fig. 29 shows profile and front view of models of the case before treatment; Fig. 30, occlusal view of same; Fig. 31, profile and front view when retention was applied; Fig. 32, occlusal view of models at this time; Fig. 33, profile and front view of face before treatment, and Fig. 34, same view after treatment.

In the treatment of a sub-division of this class, it is only necessary to apply the rubbers on the side that is abnormal.

## 16. The Adjustment of the Arches and the Application of Intermaxillary Rubbers in the Treatment of Class III.

In order to prevent, as much as possible, in these cases the labial tipping of the upper anterior teeth in moving them forward, an auxiliary wire should be soldered to the front portion of the arch, as described in No. 14. In pronounced cases of this class it will sometimes be necessary to elongate the anterior teeth as they are carried forward.

The application of the lower arch should be such as to embrace, as nearly as possible, all the lower teeth as a unit of anchorage, but it is impossible to establish stationary anchorage to the same degree as where intermaxillary force is applied in the opposite direction.

To accomplish this the lower cuspids are banded, and to these is soldered a labial wire. On this labial wire are soldered four small U-shaped pieces, made from iridio-platinum round wire .022 of an inch in

ITEMS OF INTEREST

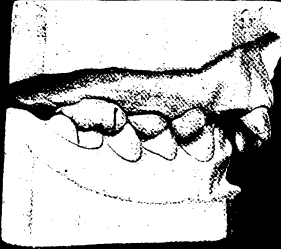


Fig. 29.



Fig. 29.

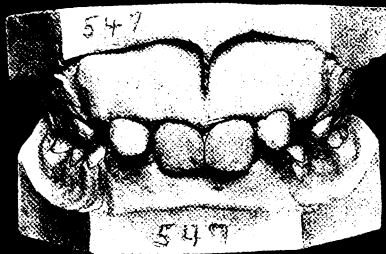


Fig. 29.

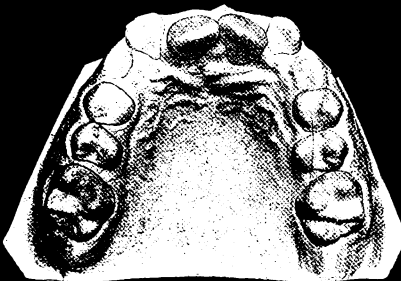


Fig. 30.



Fig. 30.



# ORTHODONTIA

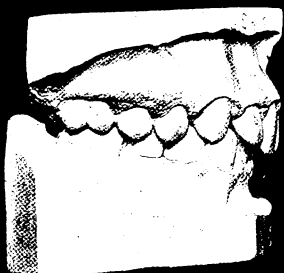


Fig. 31.



Fig. 31.



Fig. 31.



Fig. 32.

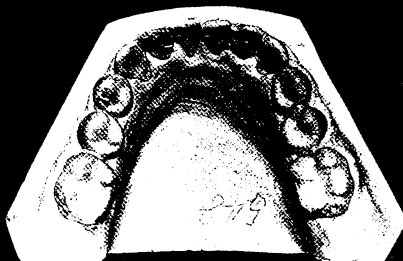
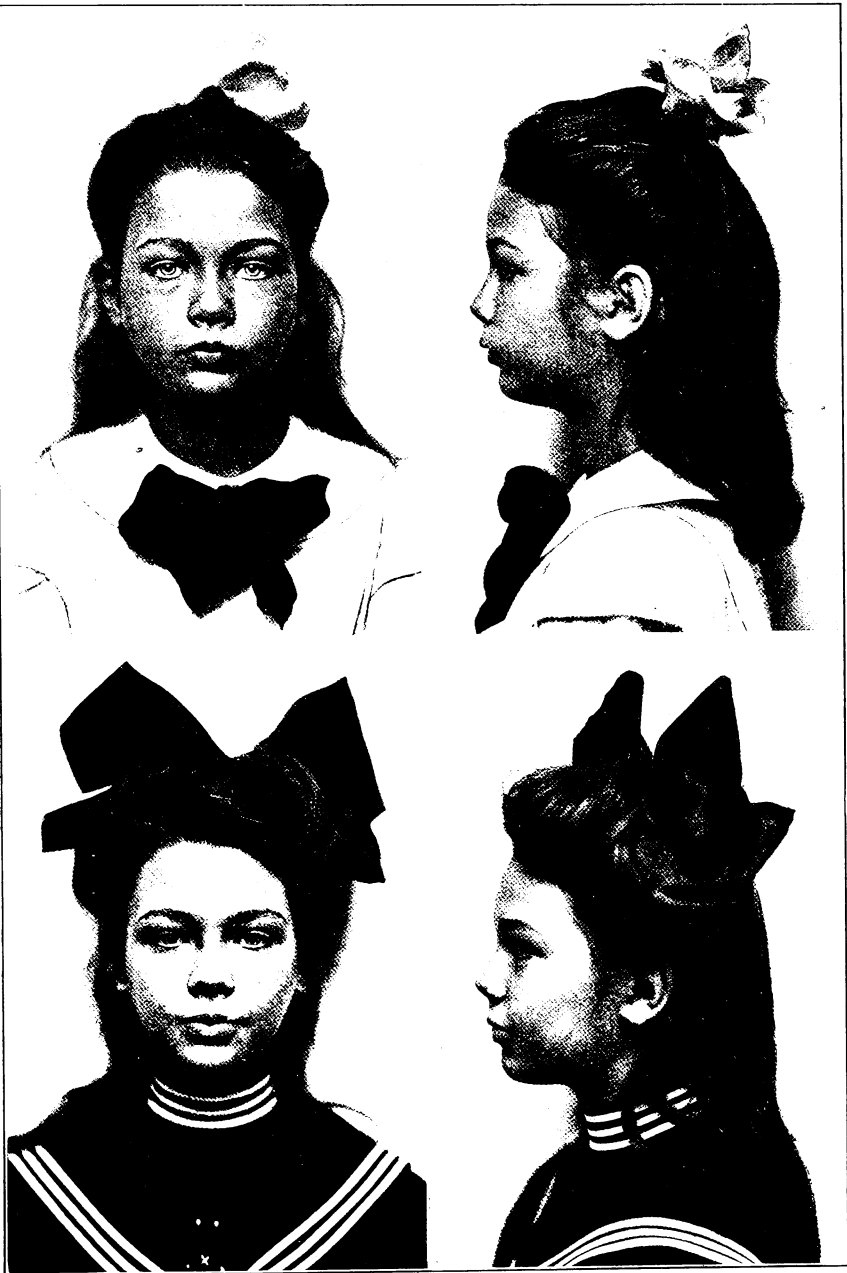


Fig. 32.

ITEMS OF INTEREST

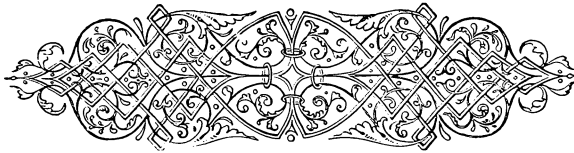


Figs. 33 and 34

## ORTHODONTIA

diameter, so as to engage each of the lower incisors on the labial surface just under the free margin of the gum. On the lingual side of each cuspid band is soldered a short, round tube, the bore of which is .036 of an inch. To the lingual screw on each molar band is soldered an iridio-platinum wire to pass forward, and so bent as to fit in the tube on the cuspid band on each side, and should enter this tube from the gingival aspect.

The expansion arch is now adjusted with Exp. A, so as to rest as nearly as possible in contact with the teeth, and securely ligated to them. In this way very little tipping of the molars can take place.





## Some Phases of Pyorrhea Alveolaris and Its Treatment by Bacterial Vaccines.

By GEORGE B. HARRIS, Sc. M., D.D.S., Detroit, Mich.  
*Read before the Second District Dental Society, October, 1911.*

Pyorrhea alveolaris is the greatest problem confronting the dental profession. While we have made some advances, and have discovered many associated conditions, we have not yet mastered this dreaded disease.

### **Salivary Calculus Due to Systemic Disturbance.**

Pyorrhea is not a purely local disease, but a local manifestation of a systemic disorder. The local phase of pyorrhea is generally produced by the formation of tartar around the teeth, producing an irritation, but these deposits are the product of a systemic disorder. The removal of these deposits is of great importance in the treatment of pyorrhea, but a cure cannot result from its removal alone. We must remember that we are removing the effect and not the cause, when we remove the tartar formations. Remove the cause and the effect, protect the infected region until regeneration has built such fortifications that reinfection becomes impossible, and a lasting cure will follow.

We must stop the formation of this tartar, then, and this cannot be done by using mouth-washes or by simply removing the tartar. Cutting the grass, gentlemen, certainly makes it shorter, but it does not stop the grass from growing. And so it is with the tartar. Its removal, at intervals, keeps the amount of the accumulation down, but it does not stop its formation.

These deposits come from the saliva. They are precipitated from the saliva in the presence of air, the air reducing the temperature of the saliva, and thus reducing the quantity which the saliva is capable of holding in solution. When the temperature is increased, part of the salt is redissolved, but most of it adheres to the teeth and sets up an irritation which, if not corrected, leads to inflammation; the area then readily succumbs to the attack of the organisms present and pyorrhea is the final result. The presence of an excessive proportion of these salts in the saliva is due to faulty elimination. Faulty elimination is generally produced by constipation and, as we can see, if we are to bring about the desired results in the treatment of pyorrhea, we must stop the formation of the tartar. Since faulty elimination lies behind the formation of the tartar, we must give this proper attention. We do not have to search the U. S. P. for something that will overcome this trouble, at least while we are treating the case. My standby is Epsom salts. I do not direct that it be taken before breakfast, or before retiring; it is administered in my office.

**Pyorrhea an  
Infection.**

However, even by using eliminatives, keeping the teeth perfectly clean, removing all the tartar, and keeping its formation under control, and by using antiseptic mouth-washes, we cannot cure pyorrhea, unless, perchance, it be in its very earliest stages. Pyorrhea is an infectious disease. Antiseptics will kill the infection, provided the antiseptic comes in contact with the infection. We must kill all the bacteria with our antiseptic, however, because if we fail to kill all, they regenerate their shattered ranks, and soon the case becomes as bad as ever. Supposing, however, that we were able to kill or remove all the infection, which we are not able to do, very little benefit would result, because any antiseptic strong enough to kill the bacteria, will in turn kill the cells of the body tissues, and the continuous use of such an antiseptic would not only prevent the formation of new cells to take the place of those destroyed by the infection, but would destroy more cells, making a much larger and more favorable ground for the growth of the infection. As soon as the antiseptic is discontinued, the area is reinfected, even if we were able to produce an aseptic condition with the antiseptic, which we cannot do; much less maintain it. Still more impossible is it to maintain an aseptic condition without the use of antiseptics, and with them we absolutely prevent a cure. It is also impossible for the patient to maintain an aseptic condition, or to prevent reinfection by using antiseptics, as very little, if any, would get far enough up under the gums, and in sufficient strength, to have any effect. If this were possible, and it certainly is not, the continued use of the antiseptic would soon break the last thread

## ITEMS OF INTEREST

of attachment which the tooth had with the alveolus, and do this far more quickly than could any infection possibly do it. We all know this, yet most of us blindly hold fast to this or that antiseptic, and trust that some time something will happen that will cure the case and relieve us of the embarrassing situation. Antiseptics will not, and cannot, cure these conditions, nor help to do so, so why base our eternal hopes on them? Again, we build great hopes around astringents.

### **Astringents Contra-Indicated.**

Astringents are good in their place, and they certainly play an important part in the treatment of disease, but when they are applied in cases of pyorrhea, they are out of their sphere of usefulness. Astringents contract the blood-vessels. Why should we desire to contract the blood-vessels in pyorrhea? The contraction of the vessels neither removes nor in any way helps to remove the cause or effect. A dentist gave a relative of mine an astringent mouth wash to use on the gums. He told her that was the best thing she could use. "That is the strongest astringent known," he said. I do not know what the astringent was, but it certainly was strong. But I would like to know how such an astringent can remove tartar, prevent its reforming, kill the infection, and prevent reinfection. By contracting the vessels, however, astringents interfere with the reconstructive processes, which Nature is trying to bring about, and which processes we are so ably interfering with by the use of these astringents.

### **Rational Treatment of Pyorrhea.**

I now pass on to what I consider the only rational means which we have at the present time of overcoming pyorrhea in its later stages. That is, by a series of treatments, to raise the individual's immunity to the infection from which he is suffering to such a high state, that Nature will be able not only to overcome that infection, but also to maintain that immunity over a period of sufficient length of time to give Nature sufficient time to reconstruct the lost tissues and to become so fortified that reinfection becomes impossible. This can be readily done by the use of vaccines.

### **Vaccines in the Treatment of Pyorrhea.**

By reason of the fact that pyorrhea manifests itself in definitely localized areas, it is very well adapted to treatment by vaccines. By treating pyorrhea by this means, we do not expect to overcome the infection directly, nor do we, but rather by a series of treatments we raise the immunity to that particular organism to such a high state that his natural resources will be able to overcome the infection. We must maintain this immunity long enough for Nature to

bring about a repair, however, as without a complete regeneration of the tissue that has been destroyed, we can expect nothing else than a reinfection, and a relapse into the same conditions again. Vaccines do this, and it is this point that makes cures with vaccines possible, where other treatments prove ineffectual.

Each organism produces a distinct poison, which is a law unto itself. An effective defense can be developed in the blood for any particular poison that will neutralize it, and so act upon the organism producing the poison, that it will fall easy prey to the phagocytes. Generally Nature develops these defenses in the blood herself, but sometimes Nature is not able to do this. This seems to be especially true in cases of localized infections, such as pyorrhea. Why Nature persistently fails to build up these defenses long after conditions seem to be the most favorable, is not definitely known.

**Anti-Bodies  
and  
Anti-Toxins.**

These defenses can be supplied, however, in the form of anti-bodies and anti-toxins, which have the power of neutralizing and decreasing these toxins. These anti-bodies are reactionary products, which have the power of maintaining an immunity to the particular organism for which they are used, for various periods, depending upon the organism itself, the patient, and the infrequency and size of the doses given. The phagocytes are the active resistive force against invading organisms, but why they do the work, for which they are intended, at certain times, and then utterly fail at other times, when they seem to be most needed, has not been definitely discovered. It is believed, however, that their success depends, very largely, upon certain substances in the blood called "opsonins." These opsonins are supposed to act upon the bacteria in such a way that they fall easy prey to the phagocytes.

**Opsonins.**

Wright first devised a way by which the opsonic power of a serum may be determined. By means of smear preparations, he first determined the average number of bacteria ingested per phagocyte when the bacterial suspension, emulsion of phagocytes and serum, are mixed together. These are compared with those ingested when the same bacterial suspension and phagocyte emulsion are mixed with normal blood serum. The difference is spoken of as the "opsonic index." By the opsonic index we are able to determine just how fast we are building up our defenses. It also proves that the bacteria raised on cultures are the same ones that are causing the trouble.

Unless the organism causing the trouble is known, and the vaccine for this organism is used, the vaccine will have no effect whatever, unless

## ITEMS OF INTEREST

the infection should be *albus*, and a vaccine for the very similar one, *aureus*, is used, you would get some beneficial results, but not as good results as you would get by using the *albus* vaccine for an *albus* infection. These two germs are very similar. We have a distinct poison produced by a distinct organism, and we must have a distinct vaccine made for this distinct organism to get the best results possible to be obtained. If there are two or more organisms present, we must make a distinct vaccine for the two of them.

There are two organisms present in most cases of pyorrhea. The one, *staphylococcus pyogenes albus*, the other *staphylococcus pyogenes aureus*. I have found the latter more prevalent.\* There are several others found in the pus and around the gingival margins, but their numbers are comparatively small, and I do not believe they take any active part in this destructive work except in extreme cases.

**Organisms  
Associated with  
Pyorrhea.**

*Staphylococcus pyogenes aureus* is about .9 micron in diameter. It grows irregularly in clusters or masses, and occasionally it is found in short chains of 4 to 10 cocci. It takes all the basic aniline dyes and retains Gram's stain. It grows at room temperature on all culture media, but will develop more rapidly in the incubator at a temperature of 36 degrees centigrade. In peptone gelatin stab cultures the growth is visible on the day after inoculation. It liquefies the gelatine quite rapidly, and later assumes a bright yellow color. Single cultures on agar-agar are circular disks of similar appearance. These disks may reach two millimeters in diameter. In the various media it renders the reaction acid, producing a sour odor. It has considerable vitality outside the body, cultures being alive often after several months. A higher temperature is required to kill them than is required for most non spore-producing bacteria—80 degrees for half an hour.

*Staphylococcus pyogenes albus* is similar in character, except that on all media it is white. The *aureus* often loses its distinct yellow color, but never assumes the white color of the *albus*, and it has not been found possible to transform the one into the other.

Vaccines reach their greatest therapeutic power when injected subcutaneously. Any area of loose tissue having an active blood supply may be chosen as the site of injection. In making the injection great care must be taken to avoid any veins, as the introduction of a bacterial emulsion directly into the blood current is very dangerous. The liberation of even minute quantities of bacterial substances in the blood current, in concentrated form, will produce great toxemia.

\*Further investigations with these organisms, since presenting this paper, leads me to believe the *albus* to be the chief organism engaged in this destructive work.



**Method of  
Making  
Vaccines.**

Autogenous vaccines give better results than do stock vaccines, and should be used in preference to a stock vaccine wherever this is found possible. The preparation of the vaccine is comparatively simple. There are several methods by which it can be made.

In obtaining the material from which we are to raise our cultures and later make the vaccine, we experience difficulty in getting a comparatively free mass. This is more so when we are obliged to make the collection from the lower gums, because it is much more difficult to keep the lower gum free from the saliva. For this reason I always prefer to make the collection from the upper, rather than the lower, gums.

To obtain the material from which the cultures are to be raised, first carefully remove all tartar deposits from the teeth selected, and paint the area with iodine. On the following day, carefully remove all food particles, dry with alcohol, paint with iodine and dry. Then carefully force out the pus from under the gums, collect some of the pus on a sterile platinum needle and plant on agar-agar or in gelatine. Allow this to germinate for from 24 to 48 hours. If gelatine culture tubes are used, melt the gelatine and pour the contents out into sterile petri dishes and allow this to germinate for from 48 to 96 hours. Separate as many of the cultures from the agar-agar or gelatine, and make four or five strokes on the agar-agar plate. This is then allowed to germinate until the agar-agar is well covered. Carefully remove as many of the cultures as possible from the plate, and transfer them to a test tube of sterile physiological salt solution. The test tube is then shaken vigorously to separate the cultures as much as possible. A centrifugal machine should be used, if one is obtainable, if not, this can be satisfactorily done by shaking with the hand. One-half a cubic centimeter is then drawn up and transferred to another test-tube. Two cm. of water is added to dilute the solution to make the counting easier and more accurate. About one-half cu. cm. is then drawn in an opsonizing pipette, and one-half a cu. cm. of normal blood taken directly after. This mixture is blown out onto a slide and thoroughly mixed. A drop of this mixture is put on the cover glass, dried, stained and mounted. It is then put in the counting chamber and the corpuscles and bacteria counted in the successive fields until at least 250 corpuscles have been counted. The reason for counting so many corpuscles is to get a good average. Since there are 5,000,000 corpuscles to a cubic millimeter of blood, we can determine the number of bacteria in a cu. mm. of the dilute solution by a simple proportional equation. Then by multiplying the number of germs in the dilute solution by the number of times the dilute solution was diluted, we determine the average number of germs in the concentrated solution per cu. cm. The concen-

## ITEMS OF INTEREST

trated solution is then diluted to the required strength and heated for an hour at 60 degrees. Tricresol, .4 per cent., is then added to prevent contamination, and sealed.

The higher a vaccine is heated the less will be its potency. Also the longer a vaccine is heated the less will be its potency, and the length of time it is heated and the temperature at which it is heated bear a direct relation to the dose to be given. The lower the temperature at which the vaccine is heated the more active will be the result, following its use. We must be sure that all the bacteria have been killed in the process of heating, however, and it is much safer to heat a little longer than seems necessary on this account, although we may not get as positive results in the same length of time. Indeed, so important is the relation of the temperature at which a certain vaccine is heated, and the length of time it is heated, that some do not heat their vaccine at all, depending entirely upon the addition of the antiseptic used to prevent contamination, to also kill the bacteria. A vaccine, made in this way, would certainly have the highest potent power possible to give it, but it would also be the most dangerous one to use.

### **Dosage of Vaccines.**

The dose of a vaccine varies with the bacteria used, and also with the manner in which it was made, as previously shown. The following table, compiled by Titeston, from various writings, is for local in-

fections:

<i>Staphylococcus albus or aureus</i>	100,000,000 to 1,000,000,000
<i>Streptococcus</i>	5,000,000 to 200,000,000
<i>Pneumococcus</i>	10,000,000 to 200,000,000

The first dose of the *Staphylococcus* is shown to be about 200,000,000; 400,000,000 as the first dose would not be too large. Never give a second injection until all the effects of the first have subsided. In order to get the best results, it seems to me best to start with minute doses, and continue the treatment over as long a period of time as is necessary, to avoid reactions, regardless of the same; and that is the important factor in obtaining the best results, as it gives Nature time to rebuild the broken-down tissue, and, unless this takes place, complete recovery will not follow the treatment.

There is another feature, in the treatment of pyorrhea, that is very often overlooked; that is, the supplying of reconstructive salts to the body, such as lime, phosphates and phosphites. If these reconstructive, bone-producing elements are in the body, Nature cannot use them in bringing about a repair.

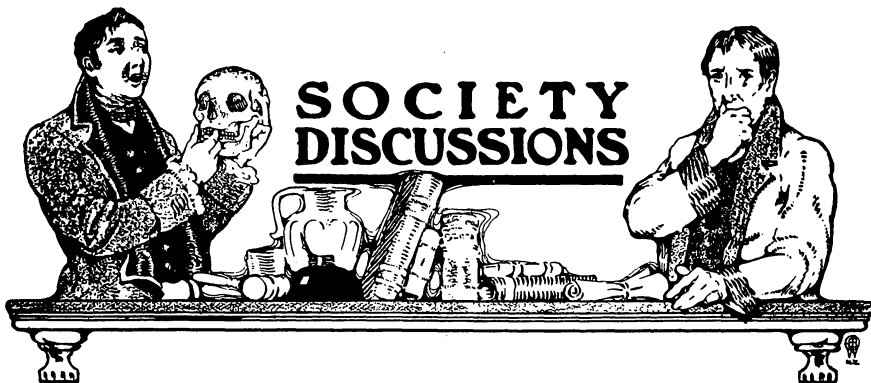
**Illustrative  
Case from  
Practice.**

Mr. W. Treatment started June 2, 1910.

Examination showed tartar deposits on all the teeth. Chronic constipation. Teeth loose, and a constant pus discharge.

Treatment as follows: Epsom salts, followed by mild laxatives nightly. Aqueous solution of lime and soda (Schlotterbeck) prescribed. A complete prophylactic treatment followed. A culture of the pus showed it to be a mixed infection of the *staphylococcus albus* and *aureus*. Opsonic index taken. It showed a very low index to both the *albus* and the *aureus*. A vaccine was made from the culture, and successive injections of 200,000,000, 300,000,000 and 400,000,000 given. A reaction followed this last injection. After the reaction had subsided an injection of 400,000,000 was given. A general improvement ensued. Injections of 200,000,000 were given one week, two weeks and three weeks apart. No reactions followed these injections. The soreness in the gums subsided, pus discharge disappeared entirely. No inflammation noticeable. The opsonic findings showed a very high index to both these organisms. Injections were continued over a period of four months; bowels kept perfectly free, and the teeth cleaned at intervals of two or three weeks. At the end of the first two months, granulations appeared and continued during the treatment. At the end of the four months the treatment was discontinued. The patient called on the 23d of September, and examination showed that perfect repair had taken place; tartar deposits were found in only minute quantities, and was carefully removed. The gums assumed their normal color; no pus discharge or soreness present. The teeth were found to be perfectly tight, and a positive cure was obtained.





### Second District Dental Society. October Meeting.

A regular meeting of the Second District Dental Society of the State of New York was held at the Kings County Medical Library Building, 1313 Bedford Avenue, Brooklyn, N. Y., on Monday evening, October 9, 1911. The President, Dr. E. H. Babcock, occupied the chair, and called the meeting to order. The minutes of the previous meeting were read by the Secretary, and, upon motion, duly approved. Dr. George B. Harris read the paper of the evening, his subject being: "The Treatment of Pyorrhea Alveolaris with Bacterial Vaccines."

#### Discussion on Dr. Harris's Paper.

This paper, by Dr. Harris, I consider very interesting, and I would like to make some remarks concerning the bacteriological part of it. There was an article in May, 1911, in the *American Journal of Medical Science*, in which Dr. Williams said that not alone the *staphylococcus aureus* and *albus* are responsible for the infection in pyorrhea alveolaris, but also the *streptococcus*, *pneumococcus* and *micrococcus catarrhalis*.

In regard to the opsonic index, I think it is a very good way to learn which bacteria produces the infection, but to use it during treatment I do not think is practical, because the patients would not consent to having blood taken so often, and, besides, having those tests made by a pathologist would be expensive.

## SOCIETY DISCUSSIONS

I think by watching the patient after you take the opsonic index once before the treatment, you can note the various diagnostic phases. Usually right after an injection there would be a negative phase, in which the patient might feel out of sorts, and have a local reaction; sometimes headaches and rise of temperature, which will subside in a day or two. Sometimes, with a first injection, the patient will show this reaction, while with the second he would not. After the patient seems well, administer it again, sometimes two injections a week.

If the patient gets an overdose occasionally, it is not harmful; that is, if you do not give it too strong. Starting with 200 million of *staphylococci*, you cannot do any harm if you increase the dose to 350 or 400 million. There might be a reaction, but it will not harm the patient.

Dr. Harris told us how his vaccines are prepared. It takes about four to eight days. There is a way in which you can make this vaccine in one or two days. If you sterilize the gums, as Dr. Harris said, you will probably get a pure culture at once. You could use this pus on your culture tubes.

The next day you will have a culture on both. If you examine the bacteria from the pus pocket, and find you have a pure culture, you can make a vaccine from that bacteria and save a lot of time. Even if you have to separate some bacteria you could do that in two days. Besides, bacteria will lose their virulence if transplanted too often, and I should not think the vaccine would be as potent as if you got the fresh vaccine in from one or two days.

Then as to standardizing vaccines. As Dr. Harris told us, he used the blood of a normal person. He tells us to count 500 million red cells—that is the standard of the blood; but some people's blood does not come up to 500 million in a cubic millimeter; some only have three and a half million. If we estimated by the five million standard, there would be quite an error in the count. In the standard count of the vaccine, therefore, we must find out first the count of the normal blood you are taking, and compare it with the bacteria.

Another thing I would call your attention to is that to use a concentrated solution of vaccine would be better than a diluted. For instance, you have ten cu. cms. of a vaccine. Usually when I make up my vaccine I put in the test tube about ten cu. cms. of salt solution, and with that I make my vaccine. I do not dilute it, because I think if you have a count of two billion of *staphylococcus* you can give the patient a tenth of this. The next dose, if you have to increase, you might give two-tenths, but if you dilute it ten times you have the 200 million in 1 cc. You have to give one cu. cm., and have to fill your hypodermic again if

## ITEMS OF INTEREST

you want to give another dose, because usually the hypodermic gives one cu. cm. You have to withdraw the needle if you give two cu. cm., and charge the needle again, which the patient would object to, while if you use concentrated vaccine you can fill your syringe to two-tenths cu. cm. and enlarge the dose, which, I think, is more practicable.

I thank the Chairman for the invitation to be present and hear this paper, and also congratulate Dr. Harris on the excellent presentation of the topic of the evening. I have been doing opsonic and vaccine work with the different infections for some time, and have treated a number of cases of pyorrhea alveolaris. As to the causative organism, my experience is quite the opposite of Dr. Harris's. He finds the *staphylococcus aureus* in all of his cases, while in my work the *staphylococcus albus* was found in 98 per cent.

The *staphylococcus albus* from these cases has a characteristic growth. The colonies are small, dull pearl color, elevated from surface of plate, hard to remove from culture surface, the cell body is tough and makes a poor emulsion in salt solution, and, in most cases, separates out or deposits on standing.

As to the disputed question, whether the condition is local or constitutional, I should say, the fact that if you take the opsonic index of one of these cases, and find the index to the infecting organism low, certainly shows the trouble is constitutional. The *staphylococcus aureus* or *albus* is the most common organism we find. In my work I have always found the *staphylococcus* to be present in one form or other, but usually the *albus*. I had one case, however, of *staphylococcus*. I have never found the *pneumococcus* which Dr. Shirmer mentions.

To those of you who attach importance to the work, the only way to have a clear conception of the treatment is to follow a case, from taking of culture to making of vaccine and giving of dose. Following the detail of a technical paper like the essay of this evening is a difficult matter. Dr. Shirmer speaks of using a dose of 200 million organisms to the c.c. In my work with the *staphylococcus* I never use under 500 million organisms to the c.c., and repeat the dose from four to seven days later. The cases have all responded to treatment, with two exceptions, both elderly people. I am unable to assign a cause for the failures other than perhaps a faulty technique.

Another interesting question is the important one of immunity. Some cases can have their immunity raised rapidly, and it will stay high. Others are slow to show any increase in immunity, and it falls rapidly, so that it is a question really of the individual case.

## SOCIETY DISCUSSIONS

I always give a guarded prognosis in these cases. I have always been able to stop the pain, the bleeding and the pus, with the exceptions noted, and on these two cases I made practically no impression. The cases have remained well to the present time, but one cannot tell how long their immunity will continue.

**Dr. Babcock.**

Dr. Downey was an old classmate of mine in medical college, and about two years ago we chanced to meet on the trolley car. Casually the question of dentistry came up, and pyorrhea, and he mentioned to me the fact that he had been treated successfully for this complaint. I made a mental note of this, and when this paper came up I remembered that Dr. Downey had been treated by vaccines, and found out who had treated him, and it led me to write to Dr. Gallagher and invite him to give us the benefit of his experiments.

**Dr. R. G. Hutchinson, Jr.** I regret that I was unable to read the paper of the essayist, as there are many points upon which I would like to elaborate, and which I cannot remember, having simply heard it read this evening.

Many of you know that I totally disagree with the statement that pyorrhea is a local expression of a systemic disorder. Many years of experience have absolutely convinced me that this is not so, and that has been corroborated by the experience of many with whom I have come in contact. There is no use treating the disease along a systemic line only to have it appear later in a local lesion. The constitutional conditions will influence any present pathological disturbance, but we must not conclude on that account that the constitutional troubles are the cause of the local.

The scientific part of the paper, as relating to the preparation of vaccines, I know absolutely nothing about. I have had no time to make any investigation of that subject, and I feel that there is absolutely no use in doing so. I will agree with the essayist in his statement that the mere removal of the calcific deposits will not effect a cure of pyorrhea. I disagree with him in his statement that salivary calculus has anything to do with pyorrhea in the majority of cases. Remember, we are not discussing the rare cases of the suppurative condition of the gingivæ, but those which Dr. Clark, Dr. Rhein, and others have admitted to be of local origin and curable. Dr. Rhein stated to me that 85 per cent. of the cases that come to his attention are of local origin and curable. That is the class we have under discussion, and the class that comes before us for treatment.

Salivary calculus seldom has anything to do with pyorrhea. It is only in rare instances where it will accumulate putrefactive matter which destroys the tissues to such an extent that they are susceptible to an infection, the sources of infection being always present in every mouth. When

## ITEMS OF INTEREST

the tissues are reduced in vitality to such an extent that they are non-resistant, a culture of that bacteria takes place.

In order to effect a cure, we must remove all foreign irritants of a mechanical nature, such as serumal calculus. I believe pyorrhea can be cured without resorting to vaccines. We must remove the serumal calculus, because it is causing mechanical irritation, but what is more important in order to effect a cure,—not a relief or abatement of symptoms,—is to remove resultant pathological tissue which is causing the trouble. That extends sometimes so far as to penetrate the bone and bring about a considerable necrotic area, and that necrotic bone must be removed or Nature cannot effect a healing of the parts.

I would even rather resort to the use of local antiseptics than to bacterial inoculation. Gentlemen, I say, "what is the use?" Are we justified in performing an operation as has been stated in the discussion where we must resort to the employment of an experienced pathologist in order to give this treatment? Are we justified even in employing an expert pathologist for this work when we are subjecting the patients to a general toxemia, which is exhibited in the rise of temperature, when in the time it takes to prepare the vaccines, according to the essayist's statement, a well-defined case of pyorrhea can be successfully treated surgically? By an able man, of course, not by an incompetent man. There is absolutely no reason for resorting to this form of treatment. The only excuse is that a man, who lacks the knowledge or technical skill to operate successfully on a case of pyorrhea, concludes, on account of his failure to effect the cure, that it must be of remote origin. As long as we adhere to that very obscure idea we will continue to labor along and grope in the dark, and it is mere guess work.

There are hundreds of men in the dental profession who have for years been successfully controlling cases of pyorrhea by surgical treatment. They must take into consideration all the factors which enter into the consideration, and must be able to execute their operation perfectly. Mal-occlusion is one of the most potent factors that must be taken into consideration.

The strongest advocates of the bacterial treatment will admit that surgical treatment is essential. By this bacterial treatment you are treating symptoms only.

As Dr. Gallagher has stated, he only promises his patients he can relieve the pain and the symptoms. He is quite right; there can be no question that these results can be accomplished by bacterial inoculation, but a cure cannot be effected. By testing the opsonic index, and raising the resistance to this particular form of infection, you simply make pos-



## SOCIETY DISCUSSIONS

sible the continued presence of this infection without an exhibition of symptoms. When it has run out there is a recurrence of the symptoms in the mouth.

When the proper surgical treatment is employed there is not only no recurrence, but there is a continuous improvement in the general condition of the patient. Tissues build up in six months, one or two years, and instead of partial cure, there is a steady improvement, so that the cases are better as time advances.

I say that this treatment which is outlined to-night not only is useless, but detrimental, because we destroy our only index to whether or not the pathological condition continues to exist.

In order to show you what I mean, and to come down to a specific statement, I want to cite a case that came under my care within the past month.

### **A Case from Practice.**

One of our practitioners, whom we very highly respect, called me up on the 'phone, stating that a patient of his was suffering from a severe case of pyorrhea. He had treated this case some three weeks before with a resultant improvement. He had thoroughly scaled the teeth, but in a week or so there was a recurrent outbreak of the discharge from the gingivæ, the tissues began to break down, and there was a more aggravated condition than had existed before the operation.

He attributed it to the low vitality of the patient, but wanted me to make an appointment to take up the treatment of this case. The patient presented on the following day. There were no deposits on the teeth anywhere, on account of the very thorough scaling by instrumentation that had been done previously. The gums were badly inflamed. There were deep pockets approximately all over the mouth, the soft tissues broken down and sloughing, and these pockets filled with putrefactive matter with a strong odor. When the pockets were sprayed out with peroxide, this odor which had existed, ceased.

The history of the case showed that the patient was in a very poor constitutional condition. He was unable to sleep more than two or three hours at night; digestion very much impaired. His attending physician stated his blood was in low condition. There was an affection of the tonsils, which was referred to a throat specialist, who said he would be able to restore the throat to a state of health in a month.

Now you may think this a fairy tale, but I can produce the patient; I expected him to be here to-night. I very carefully and gently curetted all those parts. There were no deposits to remove. In the first place, let me state this: My diagnosis of the case was that in the effort to thoroughly scale those teeth, and under the existing constitutional conditions,

## ITEMS OF INTEREST

where there was low reparative power and a tendency to breaking down of the tissues, the over-instrumentation and injury wrought to those tissues in the removal of the calculus had resulted in a breaking down of the tissues and a generally necrotic condition. Nature could not heal those parts,—could not repair the wounds. There is where your constitutional condition has a bearing incidentally. But with gentle curettement of these surfaces, and application of a local antiseptic paste and wash to help to prevent the bacterial culture on these wounded surfaces where the tissues were low in resistance, within twenty-four hours a marked improvement occurred, and the throat trouble was entirely cleared up. The patient reported to me that his friends asked him what he had done, his appearance had so greatly improved.

The first treatment was given on the 26th of September. On the 29th of September he reported that he was eating well, sleeping well, absolutely comfortable, feeling better than he had for a long time, and the parts were all healed. In fact, before he left my chair during the first sitting there was a marked improvement, which resulted from the removal of the putrefactive matter and by the hemorrhage which flushed out the toxins from the capillary system and brought fresh nutritive blood to the parts. At the second sitting, I more thoroughly curetted the surfaces of the teeth in the upper jaw.

On the 2d of October, three days later, I went over the lower jaw with a thorough curettement, delicately, not harshly, and on the 4th of October polished superficially all the teeth. There has been a steady improvement all the time, and without resorting to any other means, taking him constitutionally just as he was; and that experience can be corroborated by the patient.

I say "what is the use of our floundering around and guessing, and going so indirectly and laboriously about what can be accomplished quickly, if approached in the right way?"

I was intensely interested in the argumentative fashion in which the essayist presented his paper. He managed to clear up a number of points in connection with the constitutional phase of pyorrhea, though I am in accord with Dr. Hutchinson's views to a certain extent, and it can be proven in the practice of almost any man who is undertaking this work that many cases of pyorrhea can be apparently cured without any resort to systemic treatment,—yet there are a proportion of cases where the general system has more to do with the pyorrhea than any possible local infection.

The great work that has been done in medicine in the treatment of infectious diseases, where a specific organism is found, should lead us to

## SOCIETY DISCUSSIONS

investigation along the lines of treatment by vaccines in a proportion of our cases. I would scarcely be willing to admit that the vaccine treatment is indicated in all cases of pyorrhea, but I should imagine that where there appears to be an inability to control the suppuration or the spread of infection, vaccine treatment is distinctly indicated.

It is my firm belief that the case of furunculosis referred to by Dr. Gallagher, was a case secondary to a pyorrhea. I have found on several occasions a generalized furunculosis which sent patients abroad for treatment with the waters of Europe, which helped to eliminate the poison for the time being, but the patients were only able to be permanently cured of their trouble after a local suppurative lesion had been found in the mouth, and in several cases it was not pyorrhea, but an abscess upon the root of a tooth that had existed unobserved.

We have found that staphylococci are more prevalent in pyorrhea than other organisms, and Dr. Gallagher has claimed that they have shown in his pyorrhea cases a distinct difference in the manner of growth. Now when Dr. Gallagher or some other pathologist finds a definite staphylococcus that is responsible for pyorrhea, then I would be willing to admit that vaccine treatment is distinctly indicated in pyorrhea, just as a vaccine treatment is being taken up at the present time for the prevention of typhoid fever, and vaccination generally employed for the prevention of smallpox.

I want to refer to the case that Dr. Hutchinson so recently recited, the one in which there was a general infection, which he was able to cure by careful attention to the necrotic areas. It goes without saying that if you treat a local suppurative lesion you will take the drain off the system, and the entire mouth and tonsils and throat will clear up of the infection. That case of his, as he admits, was not a case of pyorrhea of the general run of cases, but was a case of infection of the mouth produced during the instrumentation for the cure of pyorrhea. I have seen numberless cases of a similar type, some which occur during the extraction of a pyorrheal tooth, the patient subsequently acquiring a pretty general infection of the mouth and throat, with a membrane almost suggestive of diphtheria, and most of these cases will respond to a very thorough and systematic cleansing of the mouth, whether it be surgical or antiseptic cleansing.

I do think, however, that had this patient been treated with a vaccine injection the patient would have recovered as quickly, and without any danger of impairment of other organs, and that is something we must take into account when we deal with these more severe cases of infection.

I believe there is a great deal of systemic trouble created through

## ITEMS OF INTEREST

mouth infection, and I am glad to accept the vaccine treatment as an auxiliary method in the treatment of pyorrhea in well selected cases, and I believe, too, that the men who adopt vaccine treatment should not entirely ignore the local treatment.

The difference between Dr. Hutchinson and the attitude of a pathologist in this matter, is that Dr. Hutchinson is a good pyorrhea detective. He catches the criminal and arrests him. The pathologist endeavors by moral influence to wipe out the crime, and it stands to reason that if this moral influence can be brought to bear to a sufficient extent, that the disease would be eliminated.

Why is it that we have patients with pronounced irregularities in the teeth, patients who have been filthy in their habits, and who have seldom used a toothbrush, who are open to infection, and who do not acquire pyorrhea, and other patients living under the best influence, who use the toothbrush, who are careful and have dental attention, who often acquire pyorrhea because of systemic disturbances?

I do not believe that pyorrhea is a systemic disease with a local manifestation. I believe pyorrhea is a local disease produced by many systemic diseases as predisposing factors, and, in a large proportion of cases, if we go to the trouble, we can find this systemic disease.

I have recently had a case of diabetes in which the teeth were discharging pus around their borders to such an extent that the patient was each day swallowing a considerable portion of this infected material, and by the elimination of all but local treatment in this case we were able to clear that man's urine of sugar, showing that there is a decided reciprocal influence of the diabetes upon the mouth, lowering its vitality, and the swallowing of this pus after it is once started reacts upon the general system.

It is like a great conflagration,—after it once starts it will wipe out an entire district, whereas if it had not had a chance to begin there would have been no great disaster; so the local condition, the environment of the mouth, and this local discharge of pus undermining the system, makes impossible any cure tendered toward the diabetes. It is the same in Bright's disease, cardiac troubles, faulty metabolism, and many systemic diseases. Tuberculosis is a very frequent cause of local pyorrhea, and you know well that syphilis is very likely to predispose a patient to suppurative gingivitis.

Now Dr. Hutchinson would state that these are not the class of cases we are talking about,—he would say we are talking about pyorrhea as the dentist finds it. I think the dentist has found out from a sufficient number of years of experience these highly reciprocal diseases. I believe, too, if he had been more diligent in the scaling of the teeth and curettement of the

## SOCIETY DISCUSSIONS

pockets, as advised by Dr. Hutchinson, he would have been able to keep the disease in check, and, to a very large extent, would have prevented this trouble. But are we willing to create an immense detective force of the dental profession for no other purpose than to keep up this work? If so, it would require almost every dentist in the country to check it, and they would have only time for the scaling of teeth, with none for the remainder of their work, if they wanted to check this very prevalent disease.

The paper of the evening, I believe, is a well directed one; a paper which must be accepted for what it is, a presentation of the advantages of vaccine treatment in pyorrhea,—but I do not believe that the essayist would advocate it as a general means of curing all cases of pyorrhea, and if that is what the dental profession is looking for, I am afraid they are going to be very badly disappointed. I do not believe we will find an easy means of curing a disease in which we have as yet found no specific organism.

At Albany, last May, there were a number of  
**President Babcock.** chair clinics, and one of them that seemed to attract a great deal of attention was given by a gentleman who is in the room here this evening. We would be pleased to hear from Dr. Leroy.

I have been intensely interested in the doctor's  
**Dr. Leroy.** paper, and although I am inclined to believe as Dr. Hutchinson said to-night, that pyorrhea is curable by instrumentation alone, yet I think the time is coming when there will be some other method that is going to assist us, and vaccines, beyond a doubt, will prove useful.

From my own experience I know that pyorrhea can be cured by instrumentation, and I also know that many cases that have not been cured have been allowed to remain or continue in a state of disease because the deposits were not removed.

The opsonic index, I believe, is valuable in some instances, such as was outlined by Dr. Schamberg, but the majority of cases are amenable to local treatment. There is a great divergence of opinion, I note, on the part of pathologists as to the bacteria that is the cause of the trouble. Some contend it is the *staphylococcus aureus* or *albus*, and others make another contention. I believe that Dr. Warner claims that the *pneumococcus* is the basic germ, the cause of the disease.

Dr. Schamberg very wisely remarked that when they become able to isolate the germ, and to state definitely which of those bacteria is the cause of the disease, vaccines will be established as an intelligent method of handling this disease.

## ITEMS OF INTEREST

I did not know until Dr. Hutchinson told us to-night, that Dr. Rhein considers that 85 per cent. of what seems to be generally talked of here to-night as pyorrhea, is of local origin; but if the percentage is that large, then I readily understand the great increase in the number of specialists around the country who are claiming that they cure "pyorrhea," and I also readily understand why it is that they insist that this disease is of local origin.

Unless I grossly misunderstood Dr. Hutchinson, he related a case of "pyorrhea cured," and yet there was nothing in the history recited by him which would indicate that the man ever had pyorrhea at all. The patient had some disturbance which Dr. Hutchinson did not see, and the case came into his hands after treatment by another man for the scaling of the teeth, and Dr. Hutchinson tells us that the instrumentation was so overdone that he diagnosed the case as one of infection of the wounds inflicted by the dentist, the infections coming from bacteria in the mouth.

Surgeons are doing this all the time, curing local infections by surgical means. Instead of talking about pyorrhea, and arguing whether it is local or not, if we would adopt two terms, one for the local and one for the systemic, we would rid our literature of much confusion.

Mr. Chairman, I do not like to take the floor a second time, but Dr. Schamberg and Dr. Ottolengui have failed to grasp my point. The case I cited was one which illustrates what may accompany reduced vitality, and what is very frequently attributed solely to reduced vitality where the real cause of destruction of tissue is unrecognized. I cited it as a case such as is often considered constitutional and necessary that the opsonic index should be raised to remove this local irritation. I wanted to show that in this case local treatment was conducted to effect a cure. It was not to show the result of the systemic condition. That was merely incidental.

I am very much in accord with Dr. Hutchinson, but in all the discussion I have heard upon this subject it always seems to me that there is a difference of ideas as regards the disease; that there must be a large number of diseases in the mouth that resemble what they call pyorrhea, and when someone comes forward and demonstrates clearly to us the different conditions, and gives names for each one, there will not be this difference of opinion as to the treatment.

I would only like to add this, that if pyorrhea can be cured by vaccine treatment, it will be possible then to cure caries of the teeth by vaccine treatment, or to eliminate the operation for appendicitis. It would be very well to operate on a man and remove his appendix, and then give him vaccine and say the case was cured.

## SOCIETY DISCUSSIONS

I notice the essayist did not think the vaccine treatment reduced the tenderness, all of which I have done without any vaccine treatment. I want information, I want light,—I think we all do; and if by surgical treatment the inflammation is stopped, the suppuration totally disappears, and all tenderness and soreness of the mouth disappears, as a patient told me this evening in a case I had only treated four or five days ago, why should I use vaccine? Give me the knowledge and ability to be able to distinguish between these cases that are known as pyorrhea and those cases that come from constitutional disorder, and then perhaps I will be able to discuss the paper intelligently; but I have not yet heard one man in the dental profession ever get up and discuss the question of pyorrhea and define it so that you and I could know that he meant this, or that, or the other condition.

In my experience, during the last twenty years, I find there are three or four distinctly different types of disease in the mouth which will bring about suppuration and receding of the gums; and to me, not being a bacteriologist, nor a deep scientific student, it is exceedingly difficult to explain or express myself so as to distinguish one of these diseases from the other. I have said to my friend, Hutchinson, many times: "You will render a bigger service to the dental profession if you will only classify these different conditions, and let the men understand what you are talking about." There is one man talking about one thing, and he calls that pyorrhea; another man talks about another disease and he calls that pyorrhea; naturally they conflict. I can see no more reason for using vaccine for the treatment of what I know as pyorrhea, than I can for the cure of caries of the teeth. It seems to me, from what I understand of pyorrhea, that it is something which would require surgical work.

I once had a neighbor who was a poultry  
**Dr. Curtis.**      fancier, and when I asked him what breed he preferred, he said: "If I were going to raise Wyandottes I would raise white ones, but if I were going to raise Plymouth Rocks I would not raise white ones." His favorite Wyandotte was a white Plymouth Rock.

It seems to me that some of us put it that way when we talk about the treatment of pyorrhea. I have not heard of anybody who believed pyorrhea to be a constitutional trouble that did not believe you must first operate locally before constitutionally treating it. I have not seen any man who was able to operate properly who did not think it needed local treatment. I know a man whose name I cannot give, and I have had an opportunity to observe some of the results in the practice of this man, who considered pyorrhea as a systemic trouble. I have not seen one case of pyorrhea cured in this practice. I have seen some treat it locally, as a

## ITEMS OF INTEREST

surgeon would treat any trouble of the kind, and I have seen these cases positively cured, and stay cured; so I say I am not speaking from my own experience, but must give the credit to the men who are doing the work, and it seems to me that when a man is doing the work and getting results his theories are worth while.

Dr. Shirmer has raised the question of dilution.  
**Dr. Harris.** If I used the same dilution for making the finished vaccines that I do in making the count, it would take a good many syringes full of the diluted solution to make up a normal dose. As a matter of fact, I do not make my finished vaccine from this first dilution. The first dilution referred to is simply used to determine the strength of the concentrated emulsion, from which the finished product is made as wanted.

Dr. Gallagher has given us some interesting results. He does not state, however, whether there had been any local treatment in the cases he cites or not. If there is no local treatment of instrumentation for the complete removal of all deposits, a permanent cure cannot follow his treatment. Again, he does not keep the treatment up until a regeneration has started. I realize that Dr. Gallagher is not primarily treating pyorrhea in most of the cases he has reported to-night, but shows what results he has noticed while using this treatment along other lines.

Dr. Hutchinson believes that pyorrhea is nothing more than a local condition. While every man has a right to his own beliefs, and the opinions of those on the opposite side from the right side should be carefully and conscientiously considered, for the right side might change places with the other; and while I have tried to do this while listening to the doctor, I cannot see where he supports the local theory. He says he believes that he can cure these conditions without removing the tartar, or at least believes that they can be cured, but he does not say how this is to be done. Again, Dr. Hutchinson asks us of what use this treatment is. In reply I would state that if Dr. Hutchinson will use the treatment after a thorough local treatment by instrumentation, the results will be so plain that the reasons for using the treatment will be demonstrated plainly and fully in the cases tried.

The point has been raised in regard to the use of the treatment in preventing caries. This is impossible, for the reason that you must have an active blood supply where the treatment is to be used, and this is not the condition in the teeth.

A vote of thanks was extended to the essayist for his excellent paper.  
Adjournment.





### **The Autocratic Pedagogue.**

There was some slight difficulty in choosing the above title: whether the type of individual under discussion should best be called a "pedagogic autocrat" or an "autocratic pedagogue" was debatable. In this dilemma it seemed advisable to consult a lexicon. The Standard Dictionary tells us that an autocrat is "1. A supreme ruler, whose power is unrestricted and irresponsible. 2. Any one who claims or wields unrestricted or undisputed authority or influence." The same authority defines "pedagogue" thus: "An instructor of young people; a schoolmaster; generally used disparagingly, and to indicate a conceited, narrow-minded teacher." Verily the autocratic pedagogue is abroad in the land, and as he greatly overestimates the advantages of his services, while ignorant of the menace he may become to the children placed in his care, it is time for a free discussion of the relative value of education and health, in the hope that the pedagogue himself may be taught something.

#### **Public and Private Schools.**

The education of our children is intrusted to two kinds of schools—the public and the private. These schools are managed by two totally different types of teachers. Those in the public schools are con-



## ITEMS OF INTEREST

trolled by Boards of Education, but the majority of private schools are mainly governed by masters responsible to no one.

A great many years ago a fire in a New York City public school resulted in the death of a large number of children. Since then fire drills have been compulsory in all public schools, and on several occasions children have been marched out of burning buildings to places of safety, as a result of this discipline. Whether fire drills are conducted in any private school or not is not certainly known, but there is at least one such school having over four hundred pupils, in which a fire drill is never practiced. And these are the children of the rich, whose parents pay large fees for what is supposedly the best.

The dental profession is rapidly educating public school teachers, principals, Boards of Education, and the public at large, to an appreciation of the value of sound and regular teeth as a factor in the preservation of health. An appointment with the dentist is now a sufficient excuse for a child's temporary absence from school. Hence it is not in the public school that we meet the autocratic pedagogue, but in the private school, and more especially in the so-called "boarding school."

In the January issue of *ITEMS OF INTEREST* we published an address by the last President of the American Society of Orthodontists, in which he complained of the difficulties met by the specialist, in obtaining the co-operation of headmasters, and mistresses, so that children boarding with them might have their school duties so planned that their education and the correction of existing malocclusions might go on coincidentally. Other orthodontists present reported similar difficulties. In this connection a recent experience of a New York specialist is illuminating. The headmaster of a private school, having positively refused to allow boys to leave the school even once a month, the orthodontist wrote a letter asking that an exception be made in behalf of one of his patients. The following is a part of the communication:

**Extract from  
Orthodontist's  
Letter.**

"I am told that your objection to having the boys leave the school is that there is danger of their bringing disease back with them. But, my dear Mr. \_\_\_\_\_, there surely cannot be any more danger of this sort in your school than there is in all of the other schools, and I have boys and girls in many preparatory schools about New York, all of whom come to me regularly once a week.



"I am also told that you highly esteem the value of health. And now may I call your attention to a fact to which even the medical profession is only just awakening, and that is that practically all infectious diseases have their entrance to the body through the mouth. If the mouth is in an uncleanly condition it harbors and affords pabulum for every kind of disease germ. When food is taken into such a mouth these germs are mixed with it, and carried into the stomach. If, in addition to that, the teeth themselves are defective, or irregularly placed in the arches, then the individual has not only an unclean, but an inefficient masticating apparatus, the result being that the diseased laden food enters the stomach insufficiently masticated and insufficiently mixed with saliva, and consequently, first the stomach and then the intestines are given an extra burden, with the result that they become enervated, and the whole body is insufficiently nourished which, in turn, lowers the vital resistance to disease.

"Look at the other picture. If we have sound teeth in a normal arrangement in the arches, and the mouth kept clean, then it becomes possible for the child to properly masticate his food and to keep his mouth clean, which latter he cannot do with his teeth in an irregular position. The result is that digestion goes on with the minimum wear and tear upon the digestive organs, and thus it becomes true that a perfectly nourished body may become so immune to disease germs that even if they reach the stomach they are promptly digested and destroyed.

"The dental profession throughout the country is pushing a campaign of education in regard to oral hygiene, and its importance is already conceded to be greater than the tuberculosis crusade. Indeed, the tuberculosis crusaders are joining hands with the oral hygiene men, and exhibits are being held jointly. In Boston Mr. Forsyth left a million dollars for a dental hospital. Dental clinics are springing up all over the country. New York City is arranging to provide ten public clinics for school children to be supported out of the public funds. Thus the matter of a clean mouth, and sound and regular teeth, is fast being recognized as the very foundation stone of a sound body and sound health.

"There is one more point to which I would like to call your attention. You probably know that in the past, two-thirds of all deaths have occurred under the age of twenty. Why is this? The answer is very instructive. After reaching full maturity the individual needs only sufficient nourishment to replace his own body tissues as they are destroyed by wear, excretion or waste. Now a growing child must not only have sufficient nourishment to do this, but he must have sufficient nourishment



## ITEMS OF INTEREST

with which to quadruple his own size. That is to say, a child of twenty-five or thirty pounds (when he has his first set of teeth) must increase his size and weight to one hundred and twenty pounds or more. Is it any wonder that so many of them fail to do this when the very portal through which the nourishment passes has been left unclean, uncared for and so misshapen that the child cannot possibly utilize the nourishment offered?

"I take the liberty of bringing these facts to your attention merely to show you that this matter of having a boy's teeth regulated is one of vaster importance than is commonly known. Indeed, within another fifteen years the public will be so instructed in these truths that it would be impossible to induce parents to neglect dental work for education. In other words, my dear Mr. ———, in the last analysis, education is of less importance than health, and health depends directly upon the condition of the mouth. I recognize very fully that a school term cannot go on with constant interruptions. At the same time, this care of the mouth is so important that some compromise should be possible. In the case of this boy, it would be infinitely better for him if he left school entirely for the next six months, and had his mouth put in order, provided he cannot do both at the same time. And the reason is that the boy can get an education later, whereas every half year's delay in the present instance makes the final result more difficult and less likely to be perfect.

"Now, in this particular instance, I beg of you to grant permission for Charles ——— to remain in this city at least until January 15th, and a week longer, if possible, and that after that you permit him to come to New York once a month. If you can do this I think he can be practically finished, so that there will be no interruptions next year."

The boy's New York physician wrote a similar letter, unsolicited and without any communication whatever with the orthodontist, and the pedagogue replied as follows:

**The Pedagogue's Answer.** "In answer to your letter, can only say that I am sorry to make a rule that may seem to you unreasonable, about boys leaving during the term, but we find it very necessary.

"I have written to Dr. ———, Charles' physician, and also to Mr. ———, the boy's guardian, my suggestion in this matter. It is that Charles stay in New York until your work is finished, or at least until it is far enough advanced so that the dentist here can watch it and report to you every week by telephone, as he is doing with other boys here. The only other way is to have the work done in the summer time.



I certainly cannot allow the boy to go to New York during the term. The work should have been done last summer, and it is very unreasonable to ask the school now to run any chances on account of this neglect."

This gentleman is undoubtedly sincere, but he holds so tenaciously to his own notions that it seems impossible for him to conceive that he may be wrong. His main objection to permitting boys to leave his school is that they may bring contagion back with them. This is the "chance" that he is unwilling to take. One would think that his school and its environment were the only sanitary and healthful spot in the world, and that beyond a circle, of say ten miles around his schoolhouse, germs lay in wait for an opportunity to pounce upon his boys. Yet, just at present, New York City is boasting of its improved sanitation, which has lowered its death rate to a point that compares favorably even with so-called health resorts. Moreover, in New York City we find Columbia University, which this year has a larger enrollment than any similar institution in the world; yet we do not hear of any epidemic of disease in this tremendous "boarding school," arising from the fact that students leave their dormitories and visit the city below 59th Street.

But it is the last paragraph of the letter which shows how utterly this teacher misunderstands the work of the orthodontist. He says that it "should have been done last summer," etc. If the orthodontist had written "you should have educated this boy last winter," this head-master would probably have looked upon the specialist as an ignoramus. Just how an orthodontist could rearrange eight or ten teeth which are in a state of malocclusion, change the mesio-distal relations of the two jaws, and cause twelve temporary teeth to be shed and replaced by their permanent successors, and accomplish all of this in the course of three summer months, it would require a headmaster to tell us.

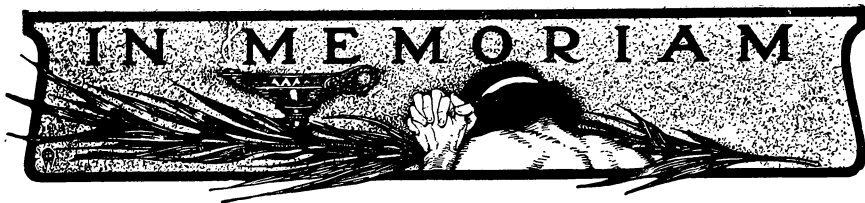
Then again, why should the boy remain in the hot city when he might be in the mountains or at the seashore, and why should the orthodontist stay in town to treat this boy cheated of his vacation, while the head-master goes a fishing? Why, indeed!

But there is a serious side to all of this, and if the headmasters and mistresses of schools cannot be made to comprehend that a child's future health depends upon the condition of his mouth and teeth, and that his

## ITEMS OF INTEREST

health is of more consequence than a knowledge of the three "R's" and a smattering of languages, dead or alive, then it becomes the duty of the orthodontists and the dentists to teach parents that school hours should be made subservient to dental ministrations, and that teeth are of more consequence than lessons.





### **Safford Goodwin Perry.**

On the twenty-second day of December the members of the dental profession of New York City, and indeed of the entire country, were stunned to learn of the unexpected death of Dr. Safford G. Perry. Only two weeks previously he had acted as chairman of a committee of twenty-five, appointed by the First District Dental Society to arrange for a banquet in honor of their president, Dr. William Wallace Walker. Dr. Perry appeared to be in the very best of health on that evening, and presided with rare judgment and a beautifully modest poise. It was therefore with considerable surprise that his absence was noted at the banquet to Dr. Wilbur F. Litch, which occurred a week later. His friends became anxious on learning that he was suffering from an attack of ptomaine poisoning, but were not really alarmed until several days later, when inquirers by telephone were told that he "was not responding to treatment as the doctors would have liked." About the fifth day of his illness he passed into unconsciousness, from which he never recovered. His death was such as we might all pray to meet; he drifted into the final sleep without ever having realized that he was approaching the borderland of the great mystery, and it is certain that his last hours were filled with pleasant dreams.

Dr. Perry was born in Wilton, Saratoga County, New York, in 1844. He was educated in the public school of his native town. His boyhood days were spent very much alone, as in temperament he differed from the lads about him. He loved books, and was especially devoted to Emerson. He gloried in Nature, and was always absorbed in thinking: and there is no doubt that upon these early impressions he drew, as from a rich storehouse, the many poetic thoughts and fancies which in later years he clothed in beautiful words and harmonious phrases.

For two years he taught school, and then began the study of dentistry with his cousin, Dr. Geo. Perry, of Yonkers, N. Y. He entered the Pennsylvania College of Dentistry November 1, 1863, and was graduated March 25, 1865. He began practice with his cousin, Dr. Geo. Perry in Yonkers.

## ITEMS OF INTEREST

About 1867 Dr. Geo. Perry opened an office on Madison Avenue, New York City, and he and Safford G. Perry alternated, each spending a week at a time in the New York and Yonkers offices.

Upon the death of Dr. Geo. Perry, Dr. Safford G. Perry closed the office in Yonkers, and remained permanently in New York, removing from Madison Avenue to 34th Street, west of Fifth Avenue, where he was for years a neighbor of Dr. Dwinelle. From 34th Street he moved to 37th Street, where he practiced for a quarter of a century. Two or three years ago he moved to 130 West 57th Street, where he was living and practicing at the time of his death. Dr. Perry thus practiced in New York City about forty-five years, and among his clientèle were the very best people of the metropolis.

Dr. Perry was twice married. His first wife was Miss Helen Darby, of Yonkers. By this union he became the brother-in-law and lifelong friend of Dr. Edwin T. Darby, of Philadelphia. Dr. Perry's second wife was Miss Francis S. Thomas. He had two daughters, Mrs. Alfred Bell and Miss Marjorie Perry.

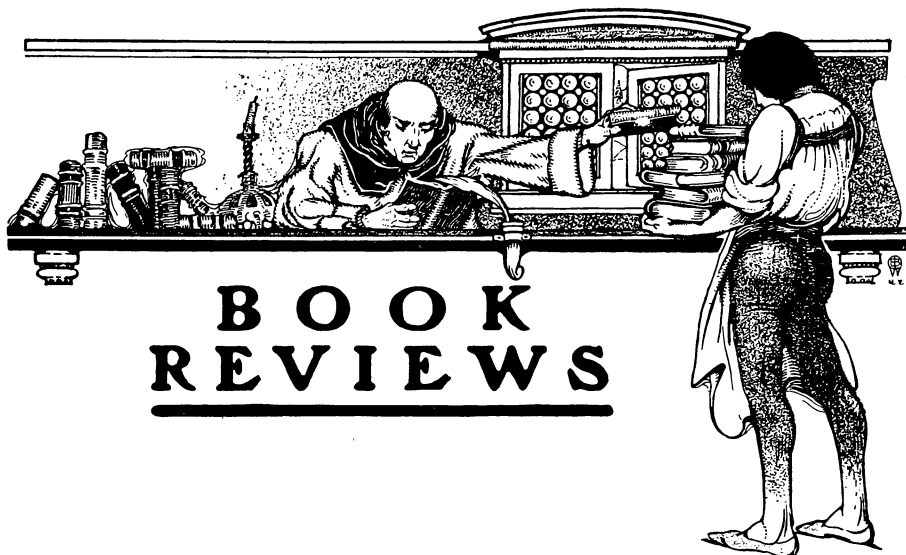
Dr. Perry was a member of the National Dental Association, New York State Dental Society, First District Dental Society, Odontological Society, and honorary member of a number of others.

He was a member of the Knights of the Round Table, the Lotos Club and the New York Athletic Club.

In his earlier years Dr. Perry showed considerable mechanical genius. He gave the profession a tooth crown, a separator, a dental engine and other useful devices.

He was a constant contributor to dental literature. His papers were always written in a conservative vein, and clothed in most attractive phraseology. He was looked up to by the younger men in the profession, admired by his confrères, respected by his equals, and beloved by his companions. He had hundreds of friends, and no enemy. His was a life well spent, and his example will live amongst those that knew him as an everlasting inspiration. Thus he will ever be with us through his work. Such men never die; they but prove immortality.





## **The American Text-Book of Operative Dentistry.**

THE AMERICAN TEXT-BOOK OF OPERATIVE DENTISTRY. Fourth Edition. Edited by Edward C. Kirk, D.D.S., Dean and Professor of Dental Pathology, Therapeutics and Materia Medica, University of Pennsylvania, Department of Dentistry. Octavo, 932 pages, with 1,015 engravings. Cloth, \$6 net; leather, \$7 net. Lea & Febiger, Philadelphia and New York, 1911.

It is now six years since the third edition of this excellent work appeared, and a comparison of the third and fourth editions serves to show how much this important branch of dental science has progressed. The passing years have brought changes; two honored names among the contributors to the prior edition are missing, Drs. Burchard and Peirce; they have passed to the great beyond. Three have retired and given place to others well known as specially versed in the subjects assigned to them, and the venerable Dr. Louis Jack, now resting from active practice, has relinquished those chapters relating to operative manipulations to an able successor, retaining only the chapter on exclusion of moisture from the field of operations. While the general arrangement of the previous editions is continued, slight changes have been made; some subjects that have become of less importance, either from disuse or general familiarity, have given place to others more recently brought to the fore.

### **Dr. Truman's Chapters.**

But few changes are noted in the two first chapters. The third, on Antisepsis, by Dr. James Truman, has been somewhat extended, to include the results of recent investigations. He considers boiling in a

## ITEMS OF INTEREST

solution of sodium bicarbonate an efficient and satisfactory method of sterilizing instruments and all of a dental operator's paraphernalia that can be so treated without injury. A very recent suggestion is to use instead of the bicarbonate, sodium hydroxide; in even a weak solution it is equally, if not more effective, and is said to have the merit of not discoloring or injuring the instruments as does the bicarbonate. It is more expensive, pound for pound, but as far less is needed, that is a small matter. Other methods are noted with the suggestion that while more convenient they are less certain. Methods that are quite satisfactory as laboratory experiments, may not prove so in everyday actual practice. More stress, possibly, might have been given to the use of alcohol as a ready and unobjectionable sterilizer for use at the work table; it is efficient, it is a solvent of fatty matter, and its ability to penetrate matter that has partially dried, and its non-toxicity, makes it more desirable than watery solutions. The multiplicity of instruments and appliances in the dentist's instrument case, and the large number that must always be at hand for instant use, although but seldom required, makes the dentist's sterilizing problem far more complicated than is that of the surgeon. This is fully recognized by the author of this chapter.

### **Dr. Jack's Chapter.**

We miss the excellent suggestion with which Dr. Jack begins Chapter four in the third edition, regarding the position of the operator at the chair. He counsels "maintaining the erect position as far as possible, with the weight sustained upon the balls of the feet to secure steadiness and ease of movement. The shoulders should be held well back that the arms be not cramped, and to permit respiration to be carried on deeply and with quietness," and enjoins "deep, slow breathing, always through the nose." Following these simple, tersely put suggestions may make all the difference between ending a full day's work fresh as a daisy, or with a racking backache, and that "all gone" feeling of which so many dentists complain; it may even do more, it may make possible a long and satisfactory professional career, while their neglect may tend to a short period of usefulness broken by frequent spells of ill health. He enjoins also, "cultivating the habit of using the fingers as a rest and a guard, so that they involuntarily seek appropriate positions, and that contact with the patient should be at as few points as possible, and should be generally made with the fingers." And further says: "Upon a careful application of the rests and guards depends the graceful and comfortable use of the instruments, and by means of them the hand passes by quick and easy gradation from the most delicate touch to the safe exhibition of considerable force." One has only to take a bird's-eye

## ITEMS OF INTEREST

view of the clinic room at some dental convention, and note the grotesque, fatiguing and ungraceful attitudes of a majority of the operators to be impressed with the importance of this instruction in a work designed for dental students. Very many need to thoroughly learn the drill-master's first lesson—how to stand, alert, at ease, and gracefully.

**Dr. Guilford's Chapters.** Chapters four, five, and six, by Dr. Guilford, embrace the various operations preparatory to cavity preparation, and the instruments employed.

While covering the same ground as the corresponding chapters in the previous edition, they are entirely new, considerably condensed, and well up-to-date.

**Dr. Weeks's Chapter.** Chapter seven, on "*Technique of Cavity Preparation*," by Dr. Thomas E. Weeks, is a systematic *exposé* of the subject, and the instruments employed by a well qualified teacher and practitioner. The new illustrations are excellent, and well designed to illustrate the text.

Chapter eight, on exclusion of moisture, the use of the rubber dam, etc., by Dr. Jack, is unaltered. So little change has taken place in these matters, that it is as acceptable now as it was when first written.

Chapters nine and ten, by Drs. Darby and Crenshaw, covering the operation of filling with gold and the associated instruments and appliances, are but little changed in this edition.

**Dr. Ward's Chapters.** The two following chapters on plastic fillings, by Dr. Marcus L. Ward, are entirely new, well written, and thoroughly up-to-date. They add much value to this edition. Not only has the use of plastics been placed upon a higher plane during the last few years, but Dr. Ward's technical work and research have made him an accepted authority on the subjects which they embrace.

**Dr. Capon's Chapter.** The chapter on "*Restoration of Teeth by Cemented Inlays*," by Dr. W. A. Capon, is especially valuable. Dr. Capon has had a long experience in all forms of inlay work and porcelain restorations;

he has been enthusiastic in their advocacy, yet withal, conservative, and as fully alive to their limitations as to their value. The dental student and the practitioner will here find ample instruction covering all phases of this interesting subject, which, within the last few years, has assumed so important a position in operative dentistry. Since the third edition of this work it has really been born again, and greatly extended by the introduction of the cast inlay.

## ITEMS OF INTEREST

### **Dr. Inglis's Chapter.**

The chapter on "*Pulp Treatment and Filling of Root Canals*," by Dr. Otto Inglis, might, with advantage, be condensed. It is a large subject, and one upon which, to this date, the profession has no settled technic. The personal equation plays an important part. While all closely agree as to essentials regarding methods and means, each operator is a rule unto himself, and esteems that best which gives him the best results. To the student the principles involved are of most importance, and a multiplicity of methods of attaining an object is confusing. It is to be regretted that the use of hydrogen dioxid in a closed cavity is not more forcibly interdicted than by a mere caution; the possibilities for harm are so great, that a mere caution is hardly sufficient; it should be interdicted absolutely, especially in a work for students.

### **Dr. Kirk's Chapters.**

The chapters on "*Pyorrhea Alveolaris, and Discolored Teeth and Their Treatment*," by Dr. Edward C. Kirk, are full and complete, so far as these matters have developed. Bleaching teeth we hear less of than formerly. The improved technic of pulp treatment has reduced the number of cases, and the more general and more successful use of caps and crowns has led to radical and certain means of getting rid of an unsightly tooth more quickly than by attempts at bleaching. Nevertheless, now and again an attempt at bleaching is indicated; if successful, it is a gain, if it fails, the failure is no bar to replacement. Dr. Kirk has given a full *resumé* of the various methods that have, from time to time, been suggested. The chapter on pyorrhea may be accepted as the latest word upon its various phases, their cause and treatment. The directions, understandingly followed, will undoubtedly bring about the best attainable results possible in treating this *bête noir* of operative dentistry.

### **Drs. Cryer and Prinz.**

"*The Extraction of Teeth and General Anesthesia*" are considered together in chapter seventeen, by Dr. M. H. Cryer. In dental practice they are so closely related, it is desirable that in a text-book one writer should cover the whole to avoid a confusing diversity of instruction. Local anesthesia, which has, to a great extent, supplanted general anesthesia in tooth extraction, is given a chapter by itself, the author, Dr. Hermann Prinz, has concisely presented the subject from a practical standpoint. The drugs employed, approved methods and appliances for producing local anesthesia for tooth extraction, oral surgery, and pulp removal, are given sufficiently full for a student's needs.

### **Drs. Angle and Case.**

Chapter twenty-one, by Dr. Edward H. Angle, and chapter twenty-two, by Dr. Calvin S. Case, covering orthodontia in its various phases, have been revised and the illustrations increased in number.



## ITEMS OF INTEREST

The contribution of Dr. Case has been given a new title, *Dento-Facial Orthopedia*. It is undoubtedly more euphonious than the old one (*The Development of Esthetic Facial Contours*), shorter, and chimes in with orthodontia so well that it merits acceptance as an improvement. While orthodontia and dento-facial orthopedia are very closely related, they are quite distinct. The first is more concerned with the mechanics of mastication, which the latter is more related to the part played by the teeth in the artistic development of the face and its characteristic features.

The work closes with a short chapter, the twenty-third, on Oral Prophylaxis, by Dr. S. H. Guilford. It is concise, and to the point.

The improvement of the fourth over the third edition is not to be measured by thirty-three added pages, nor the one hundred and forty-two additional illustrations alone. The slight rearrangement of subjects, and assigning new talent to the more progressive matters, has given the work added interest. Taken as a whole, it is an acceptable and comprehensive text-book for students and practitioners, covering the entire field of operative dentistry.

W. H. T.





# SOCIETY ANNOUNCEMENTS

## National Society Meetings.

NATIONAL DENTAL ASSOCIATION, Washington, D. C., September 10, 11, 12, 13, 1912. Secretary, Dr. Homer C. Brown, 185 E. State St., Columbus, O.

CANADIAN DENTAL SOCIETY AND ONTARIO DENTAL ASSOCIATION, union meeting, Hamilton, Ont., June 3, 4, 5, 6, 1912. Secretary, J. A.

Cameron Hoggan, Federal Bldg., Hamilton, Canada.

AMERICAN SOCIETY OF ORTHODONTISTS, Chicago, Ill., July, 1912.

Secretary, Dr. F. C. Kemple, 576 Fifth Ave., New York.

## State Society Meetings.

ARKANSAS STATE DENTAL ASSOCIATION, Little Rock, Ark.

Secretary, Dr. I. M. Sternberg, Fort Smith, Ark.

ARIZONA DENTAL SOCIETY.

Secretary, Dr. H. H. Wilson, Phoenix, Ariz.

CONNECTICUT STATE DENTAL ASSOCIATION, Bridgeport, Conn., Apr. 16, 17, 1912.

Secretary, Dr. Arthur V. Prentis, New London, Conn.

GEORGIA STATE DENTAL SOCIETY, Americus, Ga., June 11, 1912.

Secretary, Dr. DeLos H. Hill, Prudential Bldg., Atlanta, Ga.

IDAHO STATE DENTAL SOCIETY, Idaho Falls, Ia., June, 1912.

Secretary, H. F. Kimball, Salmon, Ia.

ILLINOIS STATE DENTAL SOCIETY, Springfield, Ill., May 14-17, 1912.

Secretary, Dr. J. F. F. Waltz, Decatur, Ill.

INDIANA STATE DENTAL ASSOCIATION, Indianapolis, Ind., May 21, 22, 23, 1912.

Secretary, Dr. Otto U. King, Huntington, Ind.

MICHIGAN STATE DENTAL SOCIETY, Detroit, Mich., April 11, 12, 13, 1912.

Secretary, Dr. Marcus L. Ward, Ann Arbor, Mich.



MISSOURI STATE DENTAL ASSOCIATION, Kansas City, Mo., April 16, 17, 1912.

Secretary, Dr. S. C. A. Rubey, Clinton, Mo.

NEBRASKA STATE DENTAL SOCIETY, Lincoln, Neb., May 21, 22, 23, 1912.

Secretary, Dr. J. H. Wallace, Omaha, Neb.

NEW YORK STATE DENTAL SOCIETY, Albany, N. Y., May 9, 10, 11, 1912.

Secretary, Dr. A. P. Burkhart, 52 Genesee St., Auburn, N. Y.

NORTH CAROLINA DENTAL SOCIETY, Raleigh, N. C.

President, Dr. Phin. Horton, Winston-Salem, N. C.

NORTH DAKOTA DENTAL ASSOCIATION, Grand Forks, N. D., May 14, 15, 1912.

Secretary, Dr. E. N. Hegg, Hatton, N. D.

PENNSYLVANIA STATE DENTAL SOCIETY, Pittsburgh, Pa.

Secretary, Dr. Luther M. Weaver, 7103 Woodland Ave., Philadelphia, Pa.

SOUTH CAROLINA STATE DENTAL ASSOCIATION, Isle of Palms, Charles, S. C.

Secretary, Dr. W. B. Simmons, Piedmont, S. C.

SOUTH DAKOTA DENTAL SOCIETY, Sioux Falls, May 14, 15, 1912.

Secretary, J. D. Donahoe, Sioux Falls, S. Dak.

TEXAS STATE DENTAL ASSOCIATION, Abilene, Texas, May 2, 3, 4, 1912.

Secretary, Dr. J. G. Fife, Dallas, Texas.

UTAH STATE DENTAL SOCIETY, Ogden, Utah, June, 1912.

Secretary, Dr. W. G. Dalrymple, 2421 Washington Ave., Ogden, Utah.

VIRGINIA STATE DENTAL ASSOCIATION, Old Point Comfort, Va., July 9, 10, 11, 1912.

Secretary, Dr. W. H. Pearson, Hampton, Va.

WASHINGTON STATE DENTAL SOCIETY, Spokane, Wash., June, 1912.

Secretary, Dr. F. B. Lynott, 249 Peyton Blk., Spokane, Wash.

WEST VIRGINIA STATE DENTAL SOCIETY, Webster Springs, Va., Aug. 14, 1912.

Secretary, Dr. Frank L. Wright, Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Oshkosh, Wis., July 9, 10, 11, 1912.

Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

### **Golden Anniversary of the Iowa State Dental Society.**

The fiftieth annual meeting of the Iowa State Dental Society will convene at Des Moines, Iowa, May 7, 8, 9 and 10, 1912, beginning Tuesday, May 7th, at 9 A. M.



## ITEMS OF INTEREST

The Coliseum, with its large floor space, has been secured for clinics, exhibits and lectures.

One day will be given over to the older practitioners and ex-Iowa practitioners as a home-coming event, to exhibit, lecture, clinic and banquet, to which *all* are urged to attend. This we expect to be one of our most interesting days.

The exhibits will be the largest ever given by any State Society. Complete and extensive modern dental equipments, appliances and instruments will be shown and demonstrated. And, in contrast, a large exhibit will be made of equipment, appliances, instruments, etc., of fifty years ago, that will be highly interesting and educational, and will be in charge of Dr. A. D. Clark, of Charles City, Iowa, who would be pleased to correspond with anyone who might add to this exhibit. The modern exhibits will be in charge of Dr. H. A. Elmquist, Master of Exhibits, Des Moines, Iowa, to whom application for space should be made at an early date.

Further information will be furnished upon request from ethical practitioners of other States contemplating a visit to the meeting, and to whom we extend a cordial invitation.

C. M. KENNEDY, D.D.S., Secretary,  
605 Citizen's National Bank.

Des Moines, Iowa.

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### Idaho State Dental Society.

The thirteenth annual meeting of the Idaho State Dental Society was held at Couer d'Alene, June 15-16, and the following officers were elected for the ensuing year:

President, B. M. Brookfield, of Idaho Falls; Vice-President, Wm. F. Galbraith, of Lewiston; Secretary, Horton F. Kimball, of Salmon; Treasurer, G. F. Baker, of Twin Falls.

A number of Spokane dentists, among them Drs. Francis Fisk, A. Starke Oliver and B. F. Blosser, motored over and gave interesting table clinics as well as instructive talks on dentistry in general. An effort was made to organize District Dental Societies for the State, and will undoubtedly be a success. Only two dental depots were represented, *i.e.*, Archer & Schantz, of Portland, and M. F. Patterson & Co., of Spokane.

Next meeting to be held at Idaho Falls next June.

HORTON F. KIMBALL, Secretary.

Salmon, Iowa.





### **New York State Dental Society.**

The forty-fourth annual meeting of the New York State Dental Society will be held in the Hotel Ten Eyck, Albany, N. Y., May 9, 10 and 11, 1912.

Excellent papers have been secured, and the clinics will be especially interesting.

A cordial invitation is extended to all ethical dentists.

A. P. BURKHART, Secretary.

Auburn, N. Y.

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### **American Dental Society of Europe.**

The thirty-ninth annual meeting of the American Dental Society of Europe will be held at the Palace Hotel in Brussels, April 5th, 6th and 8th. An interesting program will be furnished, and a cordial invitation is extended to members of the profession to be present.

GEORGE H. WATSON, Hon. Secretary,  
Pariser Platz, Berlin.

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### **Examination of Dentists for the U. S. Army.**

The Surgeon-General of the army announces that examinations for the appointment of acting dental surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado, and Fort McDowell, California, on Monday, April 1, 1912.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon-General, U. S. Army, Washington, D. C."

The essential requirements for securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 27 years of age, a graduate of a dental school legally authorized to confer the degree of D.D.S., and shall be of good moral character and habits.

Acting dental surgeons are employed under a three years' contract, at the rate of \$150 per month. They are entitled to traveling allowances in obeying their first orders, in changing stations, and in returning to their homes at termination of service. They also have the privilege of purchasing certain supplies at the army commissary. After three years' service, if found qualified, they are promoted to the grade of dental sur-



geon, with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon-General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present 29 vacancies to be filled.

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### **Rutland County Dental Society.**

On Tuesday evening, January 9th, the dentists of this vicinity met and organized the Rutland County Dental Society.

Constitution, By-laws and Code of Ethics were adopted, and the following officers were elected:

President—William R. Pond.

Vice-President—Percy M. Williams.

Secretary and Treasurer—Grace L. Bosworth.

The meeting was an enthusiastic one, and nearly every dentist in the county has signified his intention of joining the society. Meetings will be held once a month.

This is the first county society to be organized in Vermont, as all members of this society must be either members of the State Society or have signified their intention of joining.

The local society hopes to bring about, among other things, a wholesome interest and growth in the State organization.

Rutland, Vt.

GRACE L. BOSWORTH, Secretary.